COMPUTERWORLD

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Technology Makes Move Out of Core City Feasible

By Edward J. Bride
Of the CW Staff

CLEVELAND – Technological advances in data transmission have made it "increasingly feasible to consider remote data processing operations," when computer installations are faced with expansion or rebuilding, a DP consultant stated.

Roy S. West, staff consultant for EDP facilities with Austin Co. here, said remote operations present a "valid alternative" to the "congestion, insufficient parking space, inadequate mass transportation, deteriorating property values, threats to property, and crime in the streets."

All these factors raise a "serious question" about the economics of housing DP operations in a "high-rent" or center city complex, West claimed in a recent interview.

"A remote location, in another part of the urban area or in the suburbs, should reduce the problems of congestion, employee safety, parking, and accessibility," he added.

While urban operations may be attractive, there are specific elements that must be evaluated before relocating a DP facility, he noted. Future growth projections, the trend of the neighborhood character, and the availability of public transportation, even though most employees will arrive in private automobiles, must all be ascertained.

Easy access to major traffic arteries is important for the messenger and delivery vehicles moving between the DP center and other contact points, West stated.

"From a physical standpoint, a site should be large enough to accommodate a building designed for a minimum number of floors and relatively large open areas for each floor," he continued.

The greatest attraction of the suburbs is the availability of qualified employees in the immediate area, including married women seeking full and part time work, he said.

In a more affluent neighborhood, however, most high school graduates will go to college and few housewives will seek work for secondary income, he added.

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The Univac 9700 system includes console with Uniscope 100 display, foreground.

Univac 9700 Offers Compatibility, Price

By Frank Piasta
Special to Computerworld

NEW YORK – Univac stressed IBM compatibility and a high price/performance ratio when it introduced its medium-scale, disk-oriented 9700 last week.

The largest member of the 9000 family, the 9700 is described as offering users performance three to five times as powerful as the 9400, previously the largest 9000 series model, and more than twice that of the 360/50, at prices below those of the 370/145 for long term leased and purchased systems.

Intended for use in a high-volume, multiprogramming environment, the 9700 continues to use the plated-wire memory that has been a 9000 series characteristic. It introduces a new communications interface called the Communications Intelligence Channel (CIC), and a very fast disk drive for software operating system storage, the Operating System Storage Facility (OSSF).

Software for the 9700 is based on two operating systems, the Operating System 4 (OS-4), available with first hardware shipments in August 1972, and Operating System 7 (OS-7) scheduled for delivery in the first quarter of 1973.

OS-4, described by Univac as similar to an enhanced version of its 9400 operating system, offers source language and operator interface compatibility with 9000 series programs. Up to five programs can be run simultaneously, compared with three under DOS.

The somewhat limited level of compatibility with the IBM 360

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DP Draws Concern, Praise From Public, FJCC Told

By Edward J. Bride
Of the CW Staff

LAS VEGAS – Over half the public apparently feels that people are too dependent on computers, and that computers have eliminated more jobs than they have created.

These were preliminary results of a survey scheduled for release Tuesday morning, directly after the keynote session of the Fall Joint Computer Conference here.

The theme of this year's FJCC is "computers and the quality of life," and 71% of the survey's participants said life is better now than before the use of computers.

The study was cosponsored by the American Federation of Information Processing Societies (Afips), sponsors of the joint computer conferences, and *Time* magazine. The results revealed deep concern about the computer's role in: automation and unemployment, increased dependence on computers, dehumanization, the gathering of information on people by large organizations, and the (potential) misuse of computerized information files.

The joint computer conferences are traditionally the largest gathering of computer users, manufacturers and technicians. Upwards of 20,000 members of the computer community are expected to attend the three-day show, which ends Thursday afternoon.

The Afips-*Time* study was to be released at a public briefing, with details and percentage breakdowns on all questions. According to the results, 65% of 1,000 participants thought computers were helping to raise the standard of living. Thirty-six percent said computers create more jobs than they eliminate, although 51% disagreed.

Fifty-five percent said people were too dependent on computers.

ACM President Walter Carlson said the study could be a "base point" for measuring future impact of computers on the public.

In the technical portion of the conference, computer professionals are examining computer applications and technical developments in such diverse areas as pollution measurement and control, law enforcement, music, and sports.

It appears that the technical section will be broadened in future JCCs. Keith W. Uncapher, Afips president, said the JCC board had been conducting evaluations of all aspects of the conferences "pointed toward assuring their continued relevancy," and placing "increased emphasis" on "sessions, papers, and additional conference speak-

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Las Vegas Convention Center

RCA Enters Third Month Of Keeping Users Hanging

By Dennis Goss
Special to Computerworld

It has been business as usual for most RCA customers, since the announcement made two months ago today that the electronics manufacturer was dropping out of the computer business.

But, while a quick survey showed that most customers apparently have not been affected by the move, they are still apprehensive and confused about the future.

James Donahue, computer operations manager at Philadelphia's Fidelity Bank, a long-time RCA customer, perhaps best expressed it when he said his management is "becoming concerned."

He said he did not see how RCA could maintain present levels of service in the face of continuing layoffs. "Also, the layoffs have got to affect morale," he said.

Donald Griffin, director of data processing at the College of Marin, Kentfield, Marin County, Calif., echoed the statements of Donahue, pointing out that service must deteriorate with RCA's current employment policies.

Fidelity became an RCA customer more than 10 years ago when it offered the first full transistorized system in its size class, Donahue said. The existence of backup systems at RCA headquarters, which were

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Computers Take a Bum Rap

Automated Train Crashes, Computers Not Involved

By Craig A. Will
Special to Computerworld

SAN FRANCISCO – "Computer Error Blamed in Train Crash." "Seriously injured train engineer explains, 'The computer wouldn't let me stop.' " "The impossible happens: 'fool proof' computerized train control system allows collision."

These 2001-ish – and inaccurate – descriptions appeared in a local newspaper story reporting a crash of two test trains on San Francisco's highly automated Bay Area Rapid Transit (Bart) system this month.

This latest example of paranoia about computers was apparently triggered when the injured train operator mistakenly called his operator's console a "computer."

The accident occurred when one train, operated by an engineer on a test run, collided with an unoccupied train standing in a station.

The accident resulted in an injured leg and a rib fracture for the train operator, and an estimated $100,000 damage to the prototype Bart electric train cars. The cause of the crash is still under investigation, but it was believed to be mechanical failure or human error. The train was not under computer control.

Similar Accidents?

The accident has focused speculation on the possibility of similar accidents occurring when Bart's computerized train control system is operational. But a spokesman for the Westinghouse Transportation Division said the automatic system would have prevented the collision.

Bart, a highly sophisticated, completely automated train system, is expected to begin limited operations in March 1972. Eventually the system will connect five Bay Area counties with 75 miles of track.

Control of Bart is a complex task, since the cars, which have a maximum speed of 80 mph, are expected to run at an average speed (including station waiting times) of 50 mph, with trains arriving every 90 seconds during peak periods. To insure smooth rides, car acceleration and deceleration is limited to 3 mph/sec.

Centralized, Individual Control

This complex scheduling problem will be handled by a centralized, real-time computer system. But actual control of each train will be retained by an onboard electronic controller, and a train will stop automatically if it does not receive signals confirming that there is no train ahead.

Performance adjustments are communicated to the trains from the central computer through hardwired-logic wayside stations which allow adjustments only within certain limits.

The computer, for example, cannot force a train to exceed the speed limit on a particular section of track. Should the central computer be inoperative, the wayside stations will still allow trains to run, but at much lower average speed.

The Bart automatic train control (ATC) system was built by the Westinghouse Transportation Division, Pittsburgh, Pa. Its central computer consists of a Sigma 2 with 28K core and a rapid-access disk.

A second Sigma 2 system can automatically take over should the main system fail. The backup system is normally used for traffic simulation.

The rail system is divided into approximately 1,700 control blocks, according to Dr. W.E. Johnson, vice-president and general manager of the Westinghouse division.

The system is designed so that only one train can occupy a particular block at any one time, and approaching trains are automatically slowed down in preceeding blocks in preparation to stopping short of the occupied block, he said.

In the unlikely event that a signal is lost between any train and its control point, that train and others that could collide with it would be halted immediately, he said.

Univac 9700 Features Compatibility, Performance

(Continued From Page 1)

and 370 series offered by existing 9000 software is to be expanded with the OS-7, which will offer users source language compatibility with 360 DOS programs written in Cobol, Fortran, BAL, and RPG.

DOS users will find it easier to switch to OS-7 than to Operating System 360 (OS), Univac claimed.

Main memory storage requirements of both OS-4 and OS-7 are considerably below those needed by 360 DOS. OS-4 can run in 64K bytes, and the OS-7 needs 128K. Communications and multiprogramming up to 14 jobs can be used under OS-7 in 256K of memory. The 360 DOS requires 512K bytes for communications and multiprogramming.

Main memory uses plated wire and has a cycle time of 600 nsec for a four-byte (32-bit) word. It is available in capacities of from 64K to 1,024K bytes. Up to 256K, the memory is expandable in increments of 64K. From 256K to 1,024K, the increments are 128K.

Microprogramming is stored in a solid-state ROM that has a cycle time of 80 nsec. The unit can vary in size from 1,500- to 2,500, 128-bit words. Microprogrammed emulators for IBM 1401, 1440 and 1460 programs are available at no extra cost.

Binary add time is 15 μsec for a 32-bit word 9700.

The OSSF, for non-resident software storage, uses its own channel to the central processor. Average access time is 8.34 msec. Each drive has a capacity of 3 Mbytes. Four such drives can be installed.

The CIC, used for communications data control, operates at 60 kbyte/sec and provides processor interface, logic and control for up to 128 communication lines. Programmable logic allows the execution of such operations as editing, character manipulation and character analysis, reducing software overhead, Univac said.

Up to 16 peripheral subsystems can be operated simultaneously on the one multiplexer channel provided. Optionally, the channel can handle up to 31 simultaneous transfers. The data transfer rate for the channel is 175 kbyte/sec.

One selector channel is standard, with up to three more available as options. The data transfer rate of each channel is 833 kbyte/sec. As many as eight high-speed subsystems, such as magnetic tapes or disks, can be attached to each channel.

Other options include floating-point arithmetic and Direct Control. The floating-point feature controls long, short, normalized and non-normalized floating-point operations.

Direct Control allows the attachment of any other 9000 series processor, including another 9700, to the CPU. Another computer may be used as either a peripheral data processing system or to make up a parallel-processor system.

The standard console of the 9700 incorporates a Uniscope CRT display for operator communications. A console printer is available as an option.

Operating System-7

The OS-7 incorporates dynamic allocation of main memory, program priority, time slicing, automatic buffering of printer output and data management.

Remote job entry, systems file catalog, message control, dynamic reallocation of main storage, dynamic priority adjustment, and task control are also accomplished.

The system offers dynamic allocation of main storage at load time as well as program roll-out/roll-in and reallocation. Output from any or all language processors can be linked to form a relocatable load module, which can reside in any part of memory. All programs are relocatable, allowing multiple compilations to be performed concurrently, Univac said.

Job control services offered by the operating system include job entry and scheduling, automatic job initiation, continuation and termination, resource management, and cataloging of system files.

OS-7 includes seven main functions: message control to handle communications, information management system to provide methods for use of data, programmed support which includes utilities, processors and compilers, applications packages, and user programs.

Language processors available include DOD level IV Cobol, Fortran IV, RPG II and assembler. A precompile pass is provided with the compilers to facilitate the use of programs written for compilation under IBM DOS. Neither PL/1 or Basic is available, however.

Prices for the Univac 9700 range from $17,000/mo to $42,000/mo, depending on configuration, including maintenance. Purchase prices range from $508,000 to $1.5 million. Use of customer support facilities, customer training, and software support are included in the bundled prices, Univac said.

Move From Core City

(Continued From Page 1)

If a business does choose to move to the suburbs, a separate computer center building can be designed to provide the "flexibility and expandability required by EDP operations," he said.

"Certainly a higher degree of security can be obtained where only authorized personnel are admitted to the building," he remarked.

With increased security, "substantially" lower land and building costs, and better employee accommodations, West said the suburbs present a "valid alternative to the central complex."

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For Florida DPers

Code of Ethics Proposed

TALLAHASSEE, Fla. – A code of ethics for those employed in data processing in the State of Florida has been formulated and is expected to be included in legislation to safeguard Floridians against invasions of their privacy.

The Florida House Judiciary Committee has been hearing testimony on invasion of privacy and violations of security. Committee members agree privacy of individual citizens has been violated and they are expected to draft legislation to guard against reocurrences.

Marvin Becker, chief of operations in the Division of Electronic Data Processing, has developed the code of ethics for inclusion with any such legislation. It will govern the conduct of anyone associated with the state's DP operations, from keypunch operator to programmer.

Such legislation could not become law until early next year when the full legislature is scheduled to meet.

The wording of the code would depend on any laws that are drawn up, Becker stated, but, in any event, it would be designed to remind DP employees of their responsibilities.

Deliberate disregard for these responsibilities would result in dismissal, he added. He envisions a code in the form of a pledge to be signed by each employee.

'Encourage Confidence'

"We want to encourage public confidence in our operations," Becker said. "We want everyone to know we are aware of our responsibilities." This is why Becker believes such a code is necessary despite any laws that might be passed.

"To my knowledge, we are one of the first states to devise such a code. It will follow closely some of the regulations in force in federal data processing centers."

Testimony before the judiciary committee revealed that state computers could not be "purged" of arrest information even if the charges for which the arrest was made were dropped. An instance where teachers' addresses were released to companies that put them on mailing lists was detailed, and Becker pointed out how for $1.50 anyone can get a detailed rundown on any Floridian's driving history.

Detailed Records

State agencies have computer records on residents' legitimacy, marriages, divorces, driving habits, confinements in prisons or mental hospitals, family background and salary, Becker stated.

Erroneous information in any of these files must be erased by the DP center manager, he added. "But presently there is no one individual who can wipe out or change any record that is in error."

Poll Shows Users Split on Issues

NEW YORK – Is hardware technology moving too fast? Forty-eight percent of a group of top DP people think it is. Thirty-three percent think it's not moving fast enough. And 14% don't agree with either viewpoint.

The poll of 39 users and executives of three mainframe companies was taken after a debate this month between Charles P. Lecht, founder of Advanced Computer Techniques Corp., and Dick H. Brandon, president of Brandon Applied Systems.

Lecht argued that hardware technology wasn't moving fast enough because the human interface with computers was still bad. He said that since a user doesn't have to buy equipment unless he wants to, changes don't have to affect him.

Brandon argued that users haven't yet learned to use the equipment available years ago and progress doesn't do much good unless it really accomplishes something. He said the user's infatuation with hardware should be over and that pride should now be in system craftsmanship.

But when polled on a related question, is it important to be state-of-the-art?, the audience leaned the opposite way. Fifty-two percent felt it was important, 31% thought it wasn't, and 7% didn't agree with either viewpoint.

The contradiction appeared to stem from the fact that some of the DP people who thought technology was moving too fast also felt their DP centers had to be kept up-to-date in order to hold staff. The two-day debate ranged over 24 DP management topics, with Lecht taking the liberal view and Brandon the conservative view. The poll showed that on the 24 issues, the majority favored Lecht's views on 15, Brandon's on five, and agreed with both on four. The total number of votes cast on the issues came out 374 points for Lecht, 300 for Brandon, 164 for both, and 46 neither.

Taking in 'Abandoned' Students Cause Of School's Failure

CLEVELAND, Ohio – One of the few remaining data processing schools in this city has closed its doors, but only after working closely with the state to graduate as many students as possible and insure that the remainder would be transferred to another school.

Many of the 500 students at International Data Center originally began their training at three other schools that preceded it into bankruptcy.

"This was part of its problem. IDC could not get down to enough students to come out of it financially," noted Frank N. Albanese, executive secretary of the Board of School and College Registration, the licensing body.

The 120 undergraduates transferred to the Institute of Computer Management, one of two major DP schools still in existance in the Cleveland area, according to Albanese.

Month-by-Month Licensing

The financial condition of the defunct school merited its being closed many months ago, but the board decided to license it on a month-by-month basis in order to get the students through, Albanese said. "We were also hopeful that the school would get back on its feet."

Albanese said he thought the financial problems of DP schools might be alleviated somewhat by the inclusion of other business courses in their curricula. "This should increase the size of the student body, which will help offset equipment rental costs," he concluded.

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Mixed Reaction to DP, FJCC Told

(Continued from Page 1)

ers relating to the needs of user industries."

As for the technical portion of this FJCC, one of the papers slated for delivery Tuesday called for a "national effort" to improve the state of the art in medical uses of computers.

Dr. Baldwin Lamson, director of hospitals and clinics at UCLA, said such an effort could provide hospitals with "up-to-date information" on each patient's prior use of health facilities, status of deductibles and co-insurance, and "location and content of prior medical records."

Lamson observed the "decade-ago dream" of completely automated hospital management and communications systems has not been realized because of the difficulty in computerizing medical records.

"Hard data, such as clinical laboratory reports have been successfully processed by computer," he noted. "Doctor's observations and physical examination data, however, still largely defy satisfactory input solutions."

In another opening-day paper, a Purdue University professor criticized some government pollution regulations that may be making water quality standards "five times" as expensive as with some other approaches.

The "uniform treatment" required by the government may be five times as expensive as a system devised by using a computer model to find minimal costs, Prof. Andrew Whinston said.

Under Whinston's approach, the system simultaneously considers the possibility of achieving water quality with several methods, including flow augmentation, by-pass piping, regional and polluter treatment plants, and cooling towers in cases of heat discharge.

Special activities slated for Wednesday and Thursday include the luncheon address by Dr. Frank B. Ryan, director of information systems for the House of Representatives. Afips said Ryan would speak on DP as a "new approach" to congressional activity and performance.

The "best paper" of the conference was based, Afips said, on "quality and originality of the technical content," and was entitled "Computer Recognition of Printed Music."

Written by David S. Prerau, of the Department of Transportation/Transportation Center in Cambridge, Mass., the paper was included in a Tuesday session on "Images and Patterns."

Final count of exhibitors was fairly stable, at 210, making FJCC '71 the third largest fall show ever.

20 Years Old, But Still Valid

LAS VEGAS – "Computer people have had enough experience to judge the large machines that they have produced," said W.H. MacWilliams of Bell Labs, "and it is appropriate to take stock now, before people get too far along the new round of machines which is being started."

"Most of the papers in this meeting are devoted to computers which are now in use," the joint computer conference keynoter stated. "It has been our aim to combine the points of view of the builder and the user."

MacWilliams' comments are extremely pertinent during the 1971 Fall Joint Computer Conference, but it was 20 years ago, during the first JCC in Philadelphia, when he made the statements.

Some of the participants in that conference will gather Wednesday afternoon to reminisce on his theme, and on their earlier projections for the computer community.

One key point made in 1951 and even more appropriate 20 years later was that "in addition to keeping computer engineers employed – in itself a praiseworthy objective – a great deal of worthwhile experience has been obtained from the perhaps $30 million . . . spent so far on the latest high-speed digital computers.

"It is important to get the most out of the experience resulting from this large amount of work, so that our new machines can be made as good as possible," MacWilliams commented.

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RCA Users Keep Hanging

(Continued From Page 1)

then in nearby Cherry Hill, N.J., had been another consideration.

The College of Marin, according to Griffin, selected the equipment on the basis of competitive bidding because it best met the school's present and future academic and administrative needs. Also, RCA offered the school a 38% discount from the purchase price.

Burndy Corp., a Norwalk, Conn., based manufacturer of electrical components, has canceled its order for a large RCA 7 system but was disappointed to have to do so.

Ramon Nicholls, Burndy's director of information systems, said his company was most unhappy because it wanted the system's virtual memory capability.

The company's technical staff evaluated several systems, he said, and determined that the RCA 7 could best implement Burndy's plan for automating all phases of manufacturing, on-line, wherever possible.

Nicholls, recalling that three months had been spent preparing for the conversion to the RCA 7, has written the systems analysis and programming off as education for his staff. Burndy has replaced the proposed RCA 7 with an order for a Univac 1106. A Spectra 70/46 that had been used for software conversion will be returned to RCA by year's end.

Edward Malloy, supervisor of electronic stock transfer operations at the Chase Manhattan Bank, indicated plans were being made now to convert his operations to other computers, and RCA equipment used in demand deposit accounting was being replaced by IBM systems, even before the announcement was made.

Alex Zabinski, DP manager at Certified Grocers of Illinois, said he doubted there was much any owner could do. He noted his firm may be forced to replace its RCA equipment earlier than planned because of a discontinuance of software and hardware development.

But he was unhappy. "It is some of the best equipment we have ever worked with," he said.

Griffin, speaking for the College of Marin, also a purchaser, stated it might be impossible to get the five- to six-year expected life out of the equipment because of discontinuance of hardware and software improvements.

Banker's Life & Casualty, a Chicago insurance company, plans to use its RCA equipment indefinitely, according to John Carey, DP manager, who knows of no move to replace it.

The concern over RCA's future plans appears uppermost in the minds of those surveyed. Users typically said that, while top executives feel there may be no real problem, DP staffs are marking time, waiting to see what happens . . . as the "What Now RCA?" saga enters Month Number 3.

News Wrapup

Battle Brews Over Voter Data Bank

WASHINGTON, D.C. – A Congressional battle is brewing over Democratic proposals that the Federal Government take a hand in voter registration. The bills call for the Federal Government to mail registration cards to all voters, although the rolls of eligible voters would still be maintained locally.

Senator Gale W. McGee (D-Wyoming) has scheduled executive meetings of the Senate Post Office Committee on the bills, and Washington sources expect that at least one will be reported out favorably.

According to sponsors, the bills are intended to aid and increase voter registration. Many of those who are eligible but do not vote, however, are poor, black, undereducated, and normally vote Democratic.

The Nixon Administration is fighting the proposals. Deputy Assistant Attorney General Ralph E. Erickson, in testimony before the Post Office Committee, said the proposals "would inject the Federal Government deeper into the election process than ever before, and they involve the Federal Government in collection of data on voters throughout the U.S."

D.C. Hospitals Set Up Cancer Data Bank

WASHINGTON, D.C. – Working with funds from the Metropolitan Washington Regional Medical Program and the D.C. government, Washington hospitals are developing a computerized tumor register. The listing is designed to obtain information on the cancer problem in the Capitol and to guide researchers, particularly those interested in cancer prevention. The system will collect information about all cancer patients in the area, and bank it in one place.

Computer Innocent in Rap Sheet Mix-up

ALBANY, N.Y. – Robert Peter DeCuir had been arrested here for illegal possession of a weapon and had pleaded guilty. While he was awaiting sentencing, police queried the New York State Identification and Intelligence System (Nysiis) for a rap sheet on DeCuir. The report that reached DeCuir's judge listed convictions in Colorado and an arrest in upstate New York.

The the rap sheet was actually for another Robert P. DeCuir, of Denver, Colo. DeCuir's lawyer convinced the judge to adjourn proceedings until the error was tracked down.

A file clerk, after receiving the Albany police request, had pulled a card on the Colorado DeCuir and listed the control number on the New York DeCuir on the form sent to the computer.

Paul McCann, deputy director of Nysiis, said, "We have some 4,000 inquiries a day. An occasional human error is bound to happen." DeCuir has been placed on probation, and everyone is happy there wasn't a computer error.

'Gentlemen, Start Your Processors'

BUFFALO, N.Y. – A racing driver who is "absolutely fearless and has perfect foresight" – Stirling Moss? Juan Manuel Fangio? Dan Gurney?

Sorry, it's a computer, simulating the Watkins Glen Grand Prix circuit at the Cornell Aeronautical Labs (CAL). The simulation was used as a design tool for improvements to the race course.

By using a mathematical description of the course, and an imaginary car's engine, braking, and cornering limitations, the CAL modelers were able to run circuits in 9 seconds – on the computer. The model, of course, could drive the car at the limits of its performance, and knew exactly when to turn and brake to hit the apex of a curve at maximum possible speed.

So, a perfect driver, in a perfect Formula I car, would average 121.38 mph over the 3.37 mile circuit, hitting a maximum speed of 178 mph on the straightaway.

How's that for driving?

'Sheriff, Rustlers!' 'Get Me My Terminal!'

SALT LAKE CITY, Utah – While more urbanized states may be using computers to track stolen cars, the State of Utah is using computers to hinder an older felony – cattle rustling. Utah cattlemen use some 22,000 different brands on their stock, and the State Department of Agriculture has filed them all into a computer to improve legally required surveillance of livestock moves, sales, and slaughter.

The automation was brought on by the impending retirement of Mrs. Virginia Bushman, a department employee who drew by hand the 22,000 brands on record cards. The computer allows more frequent updates of the records, and has pared down registration time from one year to one week.

Utah actually has little problem with rustling; there aren't many cattle thieves around any more. The main need for branding is to help separate stray cattle that join herds at round-up time.

DP Dating Down, Quickie Divorces Booming

WASHINGTON, D.C. – "We try to keep a sense of humor about these things. We get 'em together and we take 'em apart." So said Bruce Lockhart of Date-Mate, a computer dating service that has branched out into Haitian divorces.

"The computer dating business isn't what it was seven years ago," another Date-Mate official said, so the company is arranging lawyer fees, divorce taxes ($160), hotel accommodations, meals and sightseeing for those who would shed their spouses.

Coding Standards Necessary

Transportation Industry Needs 'Paperless' Accounting

By Edward J. Bride
Of the CW Staff

WASHINGTON, D.C. – The Department of Transporation (DOT) will develop standards needed for the automation of freight movement data, Secretary of Transportation John A. Volpe has announced.

"It is our responsibility to determine, develop and implement the freight data coding standards needed by the Federal Government in its activities of promoting, regulating and using freight transportation," Volpe said.

DOT has assumed the "lead agency role" at the request of the Office of Management and Budget, he noted. The Transportation Data Coordinating Committee (TDCC), a non-profit industry group, is working on a parallel project to develop a uniform intermodal commodity description and code system, Volpe added.

A single cargo shipment may be redescribed as many as 17 times, to satisfy industry and government requirements imposed on transporation from point of origin to point of export, and a uniform intermodal commodity and code system could save shippers and carriers $1.2 billion annually, according to government estimates.

Edward A. Guilbert, TDCC president, said uniform codes and formats would enable the transportation industry to "move rapidly towards computer-to-computer data exchange systems" for both domestic and international trade.

After TDCCs annual forum here earlier this month [CW, Nov. 10], Guilbert told CW the transportation community "will not find itself in the same position that the brokerage and banking communities experienced as a result of the jungle of paperwork" that caused major difficulties.

Paperless Transactions

Some segments of the transport industry are heavily involved in paperless transactions. The president of Atlantic Container Lines (ACL) explained their computerized freight documentation system which has eliminated trans-Atlantic airfreighting of punch cards.

ACL transmits the data directly to England over a private voice grade line between New York and Southampton, with branches to Gothenburg, Rotterdam, and LeHavre, President Otto M. Porton reported.

"I want to emphasize that absolutely no documents are airfreighted or airmailed any longer by ACL," he told the TDCC forum. "On both sides of the Atlantic, all necessary documents are derived from transmitted data only."

While this "manifest" information is computerized, the Bill of Lading is still sent physically, "invariably" arriving after the cargo, Porton stated.

Bills of lading are normally completed after ships leave port.

Tardy arrivals of bills of lading, Porton predicted, will be eliminated with the computerization of this document, which will occur when industry overcomes its "understandable reliance" on hard copies.

A special form called the Datafreight Receipt was devised to replace the manifest documents, and another "form" will replace the bills of lading. The data will be transmitted, and the form prepared as computer output, on the receiving end, Porton noted.

Total transmission time for a complete vessel is about 60 minutes for both items, he said.

In the near future, ACL plans for computer-to-computer communications instead of the offline communications network currently being utilized.

A research consultant to TDCC, Nicholas G. Culolias, said the Bank of America has spent more than $1 million on research, and has committed "several million more" to designing a system that will calculate freight rates for motor carriers of general commodities.

The system would be linked to electronic payments transfer systems being studied and developed in the banking community now.

"The Bank of America sees this service as a step toward a national integrated set of paperless transportation information systems," he commented.

"We could also, by recording the transaction at the source, eliminate the need for 17 different commodity codes, and make the bridge in our computers to the remaining codes," Culolias stated.

"The information would also be more accurate and more timely," he said. "What I am really suggesting is that once the information is in one computer it need never come out for manual handling."

Paperless transactions and standard codes could lead to a national railroad system to control cars, among other benefits, according to R.P. deCamara, vice president of Illinois Central Railroad and chairman of a task force studying such a system.

DeCamara said rail industry critics are charging this should have been done ten years ago, but the kind of system envisioned by the Association of American Railroads board "could not have been implemented . . . even five years ago."

Now, deCamara continued, there are several "good technical reasons for the rail industry to come to grips with its need to control capacity on a national scale:

- Common codes are being created and promoted by TDCC
- Most major railroads now have computers of "such quality as to make possible a national system" using them as a base
- Railroads have about 25,000 route miles of microwave systems in operation or under construction, "a network of private communications capacity without equal"
- The "degree of sophistication" on most larger and many smaller railroads, with respect to computers and communications, makes it possible to establish a national system built, in large part, on computer-to-computer information exchanges
- Railroads are on the threshold of car identification capability that extends coast-to-coast, round-the-clock, seven days a week.

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Purchase Must Be Government Approved

Cairo's Computers Run Two or Three Shifts/Day

By Bohdan Szuprowicz
Special to Computerworld

CAIRO, United Arab Republic – In this capital of the Arab world there are over 30 computers, all highly utilized and mostly operated in government agencies.

The big event recently was an order by United Arab Airlines for an IBM 360/40 soon to be installed in Cairo. Up to date the United Arab Airlines had the distinction of being about the only one in the world operating without a computer.

IBM actually leads in computer installations here. In Cairo, IBM has it headquarters for operations in Libya, Sudan, Egypt and Saudi Arabia. There are about 13 IBM machines in operation ranging from 1401s to the IBM 360/30 at "El Ahram," the national daily newspaper of Egypt.

At the moment El Ahram's installation is the largest in the country but will of course be superseded by the United Arab Airlines and perhaps a National Computer Center installation being set up by the Agency for Public Mobilization and Statistics.

This agency is the only significant factor in getting a computer for an Egyptian operation. Each purchase of a machine, because it must involve foreign exchange, must be approved by the agency.

Besides the IBM machines ICL has already installed a dozen of its 1900 series with the largest 1905E being operated by Cairo University. Thus IBM and ICL are running neck and neck here on a number of installations basis although IBM seems to be gaining ground with a few more machines on order. NCR is the third largest supplier of computers with five systems operating, mostly Century 200s.

There also are a few machines here from the USSR and East Europe. None of those are installed on a commercial basis, however, and have mostly found their way here in the form of Soviet foreign aid to the United Arab Republic.

Industry sources here indicate there is a Russian and a Polish computer at the Military Faculty of Technology as well as a Russian computer at the Electricity Institute. The latter one does not seem to be in too much use, however, because the Institute buys machine time on El Ahram's computer which also performs the function of the largest and only service bureau in Egypt.

One Service Bureau

The service bureau and operations at El Ahram are worthy of note because of the unique function this publisher performs in Egypt. El Ahram is the largest publisher in the country of newspapers and magazines but also acts as sole importer and distributor of foreign newspapers. However, the main task of the computer operation is to insure minimum daily returns on about 400 different papers and magazines.

The El Ahram also does all the subscription fulfillment work as well as daily billing of its customers and is a very well run operation. Originally started with a 1401 card system it found quickly it needed more speed and capacity and expanded to an IBM 360/30 and sells excess time to 23 clients.

The systems and programming staff take on complete jobs including programming and running, and deliver final results to the user. This is necessary in a country where there are few installations and not many people with access to the operations.

Now that the operation has gotten well under way they are thinking of expanding again to a 360/50 perhaps but the foreign exchange problems are critical.

The centralized and nationally controlled use of computers in Egypt is underscored in that the first system was installed in 1962 at the Institute of Planning, a government agency responsible for steering the nation's economy. That first system was an IBM 1620 followed soon afterwards by another IBM 1620 at Alexandria University.

Dr. Salah Hamid, Chief of Computer Operations at the American University College here believes development of computer use in Egypt will closely follow areas of planning, statistics, data reduction as well as improved auditing and control of the country's transactions.

There is now a group in the government much interested in the future of the Arab economies and they have already considered computerization of many social sectors.

Dr. Gamal Hamden published a report called *Map and Geography of New Egypt* which indicates the planning to be undertaken and implemented by the government well into the year 2000. In the future extensive use of simulation techniques and population projection studies is planned and computers will also play a role in the national family planning program.

National Center

On the other hand Dr. Hamid thinks the establishment of the National Computer Center will hinder the development of computer industry in the Cairo area because it will limit the number of new installations by referring prospective users to the national center. The growth in new installations will continue in cities outside Cairo and in the next few years will spread into friendly neighboring Arab countries where Egypt is expected to play a leading role in the introduction of computers in the government and social sectors of the economies.

English language is used in all programming and all programmers and systems analysts are trained in London by the manufacturers. There is no shortage of programmers or other skilled personnel to operate and use computers. Many engineers and scientists make it a point to learn how to program and in most cases are able to perform their own tasks or are willing to learn how to do it themselves.

Several systems are run three shifts and most at least two shifts which indicates a high utilization of machines. This is the same pattern in other less developed countries of Asia and East Africa.

Although a lot remains to be done, says Dr. Hamid, "we feel our computer industry is a young baby which was born strong."

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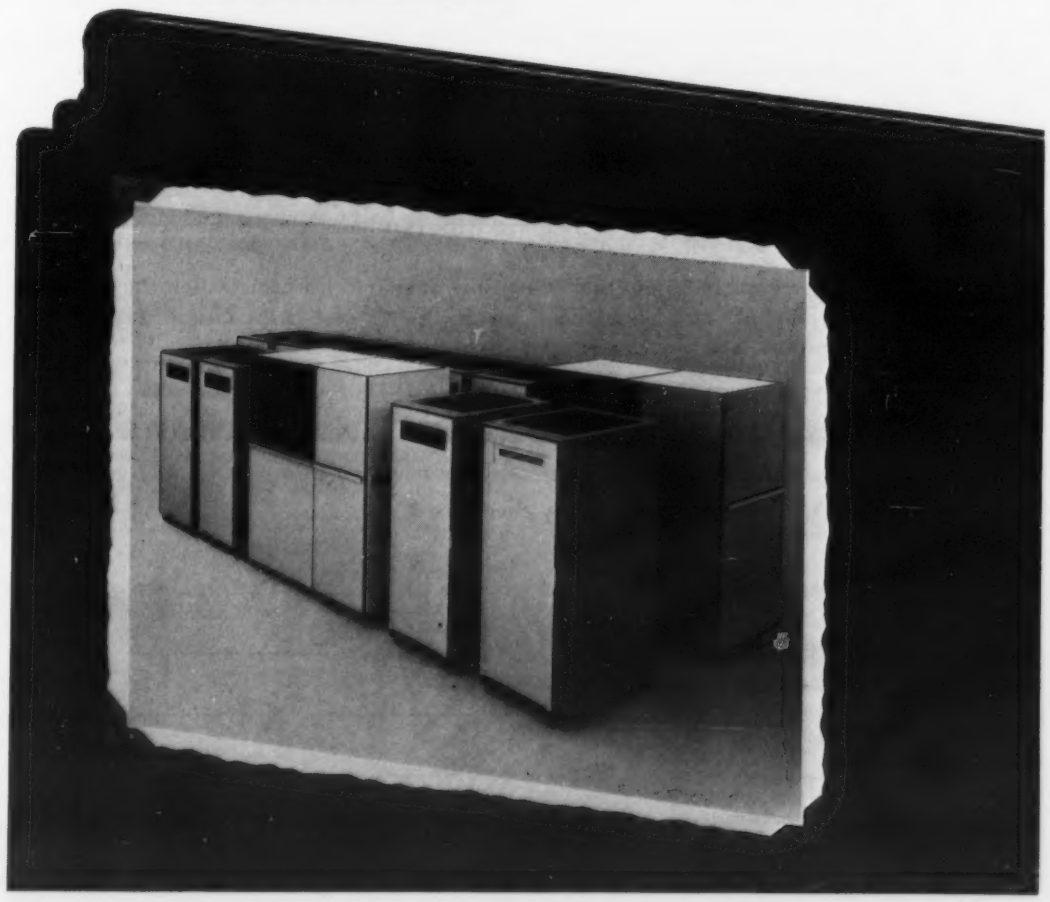

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Hospital Anticipates $625,000 Savings In Patient Charges With DP System

ROANOKE, Va. – It's there somewhere – $625,000 in patient charges lost every year at the Roanoke Memorial Hospitals.

That's how much hospital officials expect to recover with a computer-based information system linking nursing stations with medical services and administrative departments.

The system, now in operation after 10 months of development, is one of the most advanced in the country, said William H. Flannagan, director of the 725-bed hospital complex.

Besides tightening financial controls, patient care will improve dramatically, he said, by speeding up hospital services with automated communications that make human errors almost impossible.

"You know you need something like this when you see medical professionals pushing pencils," Flannagan observed.

Paperwork, which Flannagan said is overwhelming his 400 nurses, will be cut in half by the IBM 360/40 and its network of 38 terminals.

The system stores 174 Mchar. to automate 85% of a nursing station's administrative responsibilities, plus patient admissions, billing, general accounting, payroll and the laboratory and pharmacy.

Thomas L. Robertson, assistant director and hospital controller, said the $625,000 in additional revenue will come from recovery of patient charges overlooked now with a volume-saturated manual accounting system.

"Nursing stations are the point of origin of hospital services and charges – you can't recover lost charges unless you have a system that begins with patient care," he noted. "Automate the nursing stations, establish a standard procedure through the computer, and you're a long way toward solving your problems."

Each of the 29 nursing stations has its own terminal consisting of a 2760 optical image unit and a typewriter-like 2740.

Other terminals are installed in the admitting offices, clinical laboratories and pharmacies.

Nurses order prescription drugs and laboratory tests by touching the 2760 screen with a light pen. They can specify, for example, the dosage, frequency and starting time of a drug and send the order through the computer to the pharmacy.

The 2740 automatically prints a copy of the order, which the nurse must verify electronically with the light pen.

Routine prescription orders go to the computer's electronic files for sorting by drug name. The hospital pharmacies get printouts of prescription orders on demand at their own terminals.

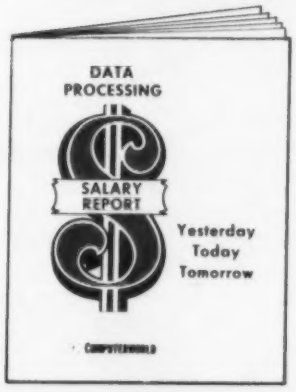
The procedure is similar for clinical laboratory tests.

Charges are posted automatically to patients' accounts as prescription and laboratory services are completed.

Between shifts, the computer sends each nursing station a report stating what remains to be done for each patient.

Medical applications run under the IBM Medical Information Systems Program; administrative applications, under IBM's Shared Hospital Accounting System.

DATA PROCESSING SALARY REPORT



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Independent Disks Cited for 7% Rise In Firm's Throughput

PALO ALTO, Calif. – A "computer utility" that has grown in three years from a four-man office to a 900-man international operation is finding installation of an independent's disk drives and 20-surface packs is maximizing production and reducing downtime.

Optimum Systems, Inc. (OSI), a large-scale DP service house offering "across-the-board" computer capability, has installed Memorex 660 disk drives and uses Memorex Mark VI 20-surface disk packs almost exclusively in its IBM 370 facility.

The firm has upped its average daily throughput approximately 7% and is saving at least 10% of "nonproductive time" simply by streamlining the physical layout of its computer room, according to Gary DeGraw, OSI director of computer services.

"In this business you can't afford to be down, or to lose information for a customer," DeGraw said. "We have found no problems whatsoever in any of our packs, which is extremely important to the smoothness of our throughput. The drives permit us to cut down on wasted personnel time to a measurable degree, because they are faster loading.

"The packs themselves can be within arm's reach on the counter-height, top-loading console when an operator knows he's going to need them. Also, there is less chance of pack damage during loading and unloading."

One Judge Per Case

Computer to Unsnarl Court Cases

By Cornelia M. Parkinson
Special to Computerworld

FRANKLIN COUNTY, Ohio – Case assignments for the 12 Franklin County Municipal Court judges will be on a computerized basis by January, 1972. The new system will insure that the same judge will hear a case from beginning to end.

According to Gervais W. Fais, presiding justice, the planned procedure will coordinate records with the Franklin County Common Pleas Court and the Court of Domestic Relations, to eliminate conflicting schedules for the appearance of prosecuting and defense attorneys and witnesses.

"We want continuances cut to a minimum," says Fais. The new assignment system was discussed and adopted unanimously by 10 judges. Now being worked out in cooperation with International Telephone and Telegraph consultant K.R.D. Hamilton, the procedure would reduce to near zero the number of case continuances made necessary by schedule conflicts.

Franklin County Municipal Court docket is now current; however, case conclusions may be delayed by continuances. Under present policy, attorneys sometimes obtain continuances simply to change judges. Requests are now processed through a motions room where the judge on duty may or may not be familiar with the background of a case, and may transfer the case to another judge.

Under computerized scheduling, should a courtroom backlog occur, each judge is to have a backup judge to whom, by agreement, he may transfer cases.

Hardware for the new system includes a Burroughs 3500. Hazeltine tape cassettes at the 25 proposed terminals will be used for backup and round-the-clock and weekend operations.

Once the assignments are computerized, says Judge Fais, computerization could be expanded to include records of the Franklin County Court of Appeals and the Ohio Supreme Court.

'Copps' Sets Future Plans For Police

KANSAS CITY, Mo. – Police have implemented a new Computer Operated Police Planning System (Copps). The program, developed by Midwest Research Institute, specifically for metropolitan police forces is designed for direct participation by the line and support commanders of major elements of the police department. With Copps, planners can depict the functioning of their own departments under a variety of changing conditions, according to Kansas City Police.

A commander may wish to know the extent of resources required to implement a new program or the projected cost factors of a revised program which requires a significant change in resources.

The system is capable of considering the complex interrelationships of literally thousands of planning factors and their changing relationships over a period of time.

Mel Bockelman, manager of the Kansas City Police Computer System, said he felt that law enforcement will continue to become more complex as a socially oriented function of government. Future problems in which the planning model will play a major part are likely to involve:

- Projecting the long-term implications of operating, maintaining, and replacing equipment such as communication systems, helicopters or computers
- Development of the required balance in organizational structure involved in a build-up of the police force
- Determining the total costs of a new operational policy including additional salaries, supporting equipment, training and personnel.

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Editorial

More Regulations

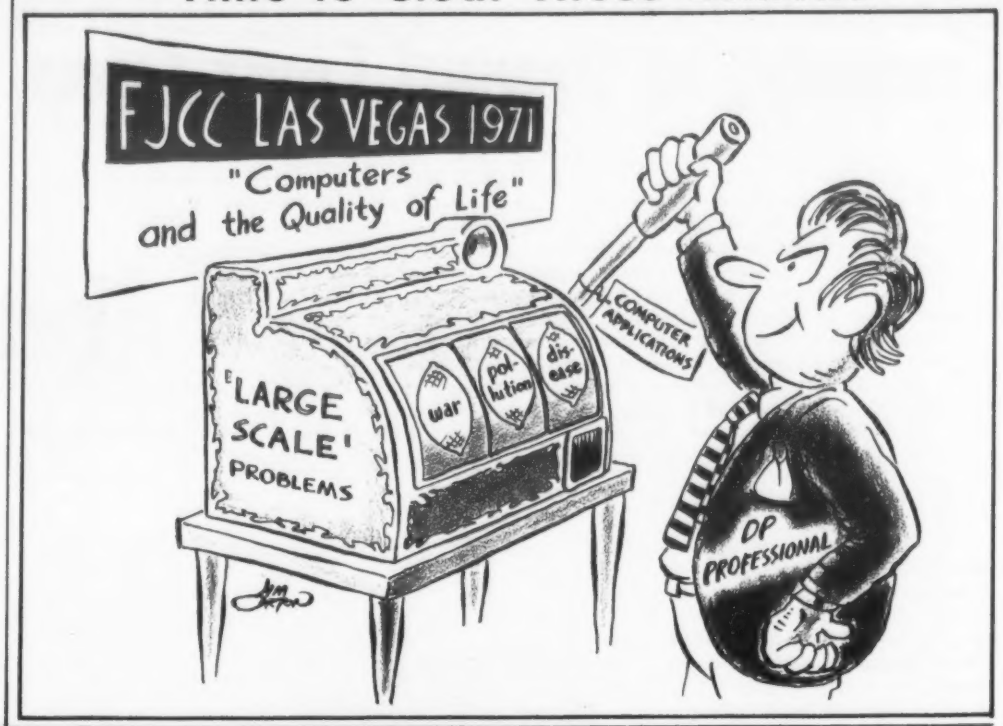
The Proxmire amendment to the Truth in Lending Act, on which the Senate Subcommittee on Financial Institutions has just completed hearings, is largely an indictment of computerized billing procedures. If the amendment becomes law, some companies are going to have to make some major changes in procedures.

If a customer questions a bill by writing to the creditor, the creditor may not take any action to collect the contested amount or to threaten the customer's credit standing until he either corrects the bill or documents its correctness.

On open-end accounts, bills must be mailed 21 days prior to the due date and payments and other credits must be subtracted from the balance before the finance charges are calculated. Also payments must be credited by date of actual receipt. Overpayments must be promptly refunded or credited.

Proved or admitted violations of these and other provisions of the amendment would result in a minimum penalty of $100 and maximum penalties possibly in the millions of dollars.

Time to Clear Those Lemons



Letters to the Editor

Users Urged to 'Discover' Real Causes of DP Problems

In the Oct. 27 issue it was reported that the Missouri Department of Revenue is exploring the possibility of turning over its data processing operation to a facilities management company. The initial reason cited was the insufficient budget for the DP department which led to low salaries which led to high turnover.

To me, what was more telling was the comment made by the department's Director of Administration Services: "By going to facilities management . . . we hope to be able to let our managers manage, rather than spend their time worrying about how the data processing department is doing."

I am suggesting that this gets very close to the root of the underlying problem causing the top management of the Department of Revenue of the State of Missouri and many other organizations to consider and/or adopt facilities management as a way out of their present DP difficulties.

I am also suggesting, that when organizations resort to facilities management they are, in most cases, only treating the symptom and not the cause of their DP difficulties.

Most top managers who resort to facilities management do this after their organizations have experienced a series of fiascos. They may have had systems that were so bad they were not allowed to go operational or, if they did go operational, died shortly thereafter. Or they may have had operation failures, systems whose current operations were not returning the benefits commensurate with the time, money and people resources that were used in their development plus the resources used in their operation.

The basic cause of a series of fiascos and/or operating failures can be traced back to an organization's philosophy of systems development. Chances are, that top and user management have been led to believe their computer people are "all knowing" and do not need their involvement in the development of systems; or top and user management have dictated a policy of non-involvement to their systems people.

One effect of non-involvement, other than the fiascos and operating failures, is the abdication by the user of his responsibility toward the automated portion of his own system. The user considers the automated portion as belonging to the DP department rather than as his own.

Appreciate that these philosophies may be accepted and even agreed to by the facilities manager who wants the contract, much in the same manner as the computer salesman who very carefully explains to top and user management "what the computer will do for you," but is much more circumspect in his statements as to what has to be done to get the computer to do what it is technically capable of doing.

Therefore, for those contemplating facilities management, it is best they be honest with themselves, "discover" the real causes of their current difficulties and then decide whether to treat the symptom or the cause. If after this analysis they do sign a facilities management contract, I am sure it will be a much better one, and their degree of success will be materially enhanced.

Arnold Barnett, Owner
Barnett Data Systems
Rockville, Md.

Progress in Punched Card Voting Procedures Cited

The Detroit Chapter of the ACM should be commended for its professional contribution to community service in preparing their Data Processing Voting Report [CW, Oct. 20]. It is unfortunate that the Los Angeles DPMA did not recognize similar professional responsibility in Los Angeles after the 1969 vote count difficulties.

But I believe it is important to identify the substantial progress made since the Detroit elections in 1970. Computer Elections Systems (CES) is assisting Seattle in a planned conversion to punched card voting by pilot testing a number of precincts in this year's elections.

Datamedia International has introduced full-scale simulations of the count center operations as a method of training key personnel. All major equipment suppliers have placed additional emphasis on planning, and have successfully completed some 20 to 30 elections since Detroit.

Colby Springer suggested software improvements (1971 SJCC) which are now being made available as a software package through the major suppliers. Bill Durley, Sacramento County clerk, is developing in-use quality control tests for equipment.

Secretaries of State Edmund G. Brown of California and Ludlow Kramer of Washington have initiated staff studies to improve procedures, testing, and security.

A recent survey suggests that 22 million voters will be using punched card voting for the first time in 1972. I hope that professional organizations will participate with their communities in planning and executing these conversions, and that no more "investigations" will be required.

James Farmer
Systems Research, Inc.

Control of IBM Possible With Sophisticated Users

Joan Van Horn's dramatic and emotional outburst against IBM [CW, Oct. 13] does require a response, perhaps not from IBM but from responsible members of the data processing industry everywhere.

Many of the observations she makes are patently true: IBM does have a monopoly, enhanced further by the RCA debacle; IBM is often arrogant, and certainly is more interested in the welfare of its shareholders (as it should be) than in its users.

However, the solutions she proposes are neither feasible nor in the best interests of the industry.

It is not possible to "break-up" IBM into small elements without destroying the industry as we know it today. The very growth of the industry is directly the result of the confidence IBM has installed (albeit often misplaced) in the top managements of most major corporations.

And breaking up IBM into larger elements, as proposed by Justice in its briefs, is simply going to generate more and more, stronger and stronger IBM components, along the lines of the sorcerer's apprentice.

Thus, the solution does not lie in the destruction of the industry by destroying the largest force in it. The solution lies in harnessing and controlling that force. If Miss Van Horn rightly does not want government control, may I suggest that we advocate and encourage user control.

More educated and more competent data processing management can deal with and contain IBM, and can also more realistically convince top management to use competitive brands where they are genuinely superior.

The solution lies in increased user sophistication, maturity and courage, not in childish destruction of that which threatens us. I believe that users can be organized and educated to approach their vendors in a more realistic manner. In fact, I think there are signs already of such sentiments among the larger and thus more sophisticated users.

Dick H. Brandon
Brandon Applied Systems, Inc.
New York, N.Y.

DP Monopoly Seen Hurting U.S. Position of Strength

It is unfortunate that the "good guy" or "bad guy" debate about IBM is used to distort the fundamental problem which now faces the computer industry. The issue is the consequences of a monopolistic computer industry in the U.S.

The U.S. is presently the world's leader in computer technology. Domestically, our country could not survive without computers. Our leadership in world computing has been a result of our internal technological requirements and the pre-1965 intense competition in the industry.

Without this competition, technological progress will stagnate and we will soon find ourselves in second or third place in the worldwide computer industry. Stagnation has already begun. Loss of leadership in computing will have disastrous effects on our economy.

It will have even more disastrous effects on our strength as a world power. When you consider that almost every major defense system protecting our country has been based on our technological leadership in computers, our loss of leadership in this area would be criminal.

Many people in the "IBM is a bad guy" school develop simplistic and interesting strategies for breaking IBM's monopolistic grip on the computer industry. Unfortunately, these plans all seem to hurt IBM but none of them has the depth to accomplish the real task at hand: keeping the U.S. as the world's leader in computing.

Hurting IBM is easy; solving national problems is tough and difficult. A good solution requires all of the business and technical skill at the industry's disposal. It also requires that we care – not about IBM, but about the U.S.

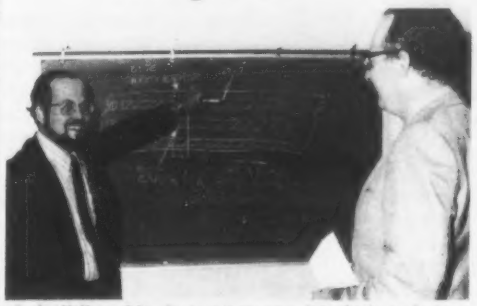
Gerald H. Larsen, President
Unicorn Systems Co.
Los Angeles, Calif.

Computerworld welcomes comments from its readers. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

Is Real War of Independents Beginning?

STC Offers Real Alternative, Not Just 'Plug' Economy

Components of an Independent Building Block



A building block system can be designed, internally, just as the designers want, instead of having to closely follow IBM techniques as is the case with plug-to-plug operation. STC designer Juan A. Rodriguez explains how the error controls work, one of the unique features of the STC tape subsystem.

Designers must also provide their own full diagnostic system for maintenance purposes. Jim Meadows explains the controls which allow the loading of special diagnostic microprogrammed routines from tape into a small computer in the STC controller. In the rear a chart shows the four sets of diagnostic aids.

William Arthur shows his new design for reel motors while Taylor awaits the end of a speed test so that the claimed 400 kbyte speed can be checked. The test was successful.

During the past three years the term "plug-to-plug" compatibility" has entered into the data processing language. It has meant that users could save money by buying their peripheral equipment, particularly tape units and disks, from non-IBM manufacturers.

The savings have often been quite considerable and the plug-to-plug industry has done pretty well. It is no longer an uncommon sight when going into even a medium size installation to find Century or Memorex disk drives, Telex or Ampex tape drives, to name but a few of the many such manufacturers.

The Taylor Report
By Alan Taylor, CDP

This has had its impact on all computer users, regardless of whether they actually purchased the independent manufacturer's products. Based, as it was, on the basic concept of providing approximately the same service in the same way for less money, the plug-to-plug industry introduced price competition into the tape and disk areas.

And IBM responded to this competition. Its 2319s brought the price of disk storage down and the 3420s have done the same for the tape users.

Indeed at one time it began to look as though the whole plug-to-plug industry might vanish in a type of "gasoline" price war because of the reductions whittling away at the base of profitability.

Independence Useful, But

It was clear that merely "metooing" the products of IBM had, therefore, somewhat less attractiveness than being able to produce a totally independent product to sell in competition with IBM.

What was not clear, however, was whether real independence could be provided while retaining the necessary user compatibility. There were quite a number of firms who said they were going to do it, but, in the computer industry, like in most industries, it is generally better to wait and see.

It does not seem to be necessary to wait and see any longer. At the Fall Joint one such independent peripheral firm, Storage Technology Corp. (STC), is showing its latest Model III Micro-Programmed Tape Controller, and its new 400 kbyte half-inch tape drives, which are 25% faster than the new IBM equivalents.

When said just like that, this does not appear to be important, unless you happen to want particularly fast tape drives.

But there are a number of characteristics about this equipment which seem to me to add up to something more than just this 25% performance improvement, important although this undoubtedly is.

It seems to me that what Storage Technology has actually done is produce a viable "building-block" which is independent of the main computer, rather than some modified chinese copy that is essentially dependent on the functions of someone else's system.

As such I think STC has indicated the way that the independent computer industry is going to be supplying users in the future, as they mature out of the plug-to-plug stage.

Many Things Different

Taking a look at the new tape building-block and comparing it with the equivalent IBM equipment (the 3420s and 3803s which have just started being delivered), the first thing that becomes clear is that the STC designers have not been constrained to copy the IBM approach.

The connections between the tape unit and the controller, and even between the controller and the channel itself are not IBM-identical. STC argues that because of this it has been able to improve both the performance and also the reliability of its systems. STC certainly has been able to improve the performance; I know this because I timed the equipment to check out its speed, but the reliability question remains.

And that is a very different matter.

Moreover, it is probably the most important one to a user once the price/performance ratios have been established to be satisfactory. It certainly is no good having high-priced performance, but low reliability. Not to the user anyway.

Three Reliability Facets

Reliability has three major facets. To start with there is the pure mean-time-between-failures. To continue with there is the time taken, and resources used to diagnose the problem.

And then, after the diagnosis is completed, there is the question of how long it takes to bring the system right back up-to-date.

Past Troubles With Tapes

The bugbear in the past with tape units was the fact that, as they were all interconnected in a daisy-chain, when one tape went down, unless the problem could be noted visually, maintenance could not start until it was physically disconnected from the daisy-chain.

STC had handled this problem in its previous drives by providing for an electric by-pass which kept the daisy-chain complete, while isolating the suspected unit from the rest of the system at the touch of a switch.

A functionally equivalent capability is now offered by IBM with the "radial" interconnections of the 3420s. So far, so good. The systems are equivalent to the user here. But isolating the unit is only the beginning of treating the realiability problem.

The next problem comes in the diagnosis of what is wrong with the tape unit. Here most plug-to-plug manufacturers have fallen back on the use of the IBM-supplied diagnostic routines which may or may not identify the general area where the failure is occurring. But they certainly are not designed to be able to identify the particular parts of the independent subsystem, so as to improve the speed with which it can be brought back up.

Diagnosis Independent

STC has gone a different route. It has, to start with, supplied its own STC routines equivalent to the IBM diagnostics so that they can be run by a computer operator, and which are designed to handle particularly the STC drives.

But in addition to this it has also provided, within its own area, in the STC controller, for a set of diagnostics *independent of the central computer system* for the use of the service engineer.

These new diagnostics are loaded from another tape drive (not from the computer), and, as they provide for an almost 100% redundant path during the load, can provide for diagnostics both of tape drives, and for the controller itself.

Customer-Selected Service

The way they will be operated is determined by the installation itself depending upon its own immediate needs. Sometimes the operator will decide to minimize use of channel time during maintenance (because, during the actual running of the diagnostics, the channel is blocked out in the same way that it is when a tape block is being read.)

Sometimes he will decide to minimize the time until the unit is brought back into operation. The choice as to which approach to take is up to him. The new diagnostic packet allows STC to offer either alternative – another advantage of independence.

Interaction Also Attacked

However, independent and on-line diagnostics still do not make a complete diagnostic package because one of the possible problems that may arise is when a matter of system interaction is causing difficulty. This problem will only arise, say, immediately after two disk orders are followed by a re-wind and a tape read or some other weird combination of events.

Here, finding the fault, or proving that it is not in the tape system, cannot be done just on the subsystem basis, but has to be done on a total systems approach.

Again, STC has taken an independent approach. While acknowledging that IBM has routines that probably will do just as much and in very much the same way, it has decided not to rely on these but to provide its own systems software – which STC calls rattler. It exercises both the tape units, and the rest of the computer system.

In short, the "independent" characteristic is now not just that the supplier is non-IBM, but also that it is practically independent of the IBM system in its maintenance and reliability operations. This means that the independent is supplying complete building-blocks, not just replacement parts as is the position of plug-to-plug suppliers.

Independent Building Blocks

Independent building blocks are a totally new concept in computers. Until now the basic assumption has been that the whole of the computer system will be available in order to provide for the maintenance of the smaller subsystems.

This system for years has been getting, of course, more and more ridiculous from the user's point of view, as the tasks given to different subsystems have become more and more specialized.

Looking forward to the days of the independent approach which are coming, where even the central processor itself can reasonably be expected to be just another building block, this reliance on total system availability clearly is not too viable an approach for the long run.

But now that it can be seen that really independent subsystems are possible (after all if STC can do it, so can other firms) there is every reason to believe that we are entering a new era – the era of computer building blocks.

Just what the full effects of the new building block approach at the user level are going to be are not clear yet. But they can already be seen to be important for data reliability, and for subsystems specialization. These are subjects in their own right, and I will be writing on these shortly.

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education

UCLA Lists Quick Courses

LOS ANGELES – Short courses to be offered by the University Extension office at UCLA during January, February and March will provide users who can spare the time an intensive look at any of several DP-related topics.

Classes will run from 8 a.m. to 5 p.m. each day and courses will usually last a week, according to university spokesmen. One exception is a two-week course in March on recent advances in engineering mathematics.

Other topics will include practical optimization algorithms, in January, and systems evaluation and measurement techniques, in February. The theory and design of "fault-tolerant" digital computers will be considered in March.

A third week-long session in March will look at effective vs. efficient computing.

Details on all the courses and conferences are available from the University Extension Office, 6115 Mathematical Science Bldg., 90024.

English DP Schools Rapped by Magazine

CW European Bureau

LONDON – Private programming schools generally aren't worth the money they charge, according to the English consumer magazine, *Which*.

Weak admission policies and ineffective preparation of students were the main criticisms. State-aided technical schools and colleges were recommended as cheaper alternatives.

A team of 24 Consumer Association members were sent to six schools, and 21 were accepted for training. After being accepted, however, eight of these students scored below average when tested independently by the National Institute of Industrial Psychology.

The tests used by the institute were part of a series being developed in conjunction with the government-sponsored National Computing Centre (NCC), for use in evaluating candidates for entry-level jobs in industry.

The association also talked with graduates of the schools, employment agencies and DP managers. Forty-six of 99 graduates interviewed had obtained jobs as programmer trainees. Two thirds of all the graduates said they were satisfied with their training.

Spokesmen for the 40 employment agencies contacted were less satisfied, however. Out of 233 programming school graduates that the agencies presented for 759 vacancies, only nine had achieved any sort of job in the computer industry, they said.

Only 109 out of more than 6,000 programmers in installations surveyed came from private programming schools.

Australian Colleges to Offer Degree Programs Next Year

Special to Computerworld

MELBOURNE, Australia – Degree courses in computer sciences, which may become the measure of professionalism within Australia's DP industry, are expected to be started shortly by some of the technical schools affiliated with the Victorian Institute of Colleges.

Early next year, Caulfield Institute of Technology, one of the VIC affiliates, will offer a degree program in commercial DP applications.

Another VIC affiliate, The Royal Melbourne Institute of Technology, is expected to begin a degree program in the more technical and scientific aspects of the DP industry.

Proposed curricula and details of the individual courses are being studied by a committee organized to define the qualifications for membership in the Australian Computer Society.

Dearborn Asks Users

Survey Helps College, HS Plans

DEARBORN, Mich. – DP students in both Henry Ford Community College and Dearborn High School should have on-the-job training, and both institutions should include training specifically for computer operators as well as programmers.

These recommendations were made by a special school-industry study group, following a survey of DP installations in the greater Detroit area and former DP students of the college and the high school.

Other suggestions included the addition of course work in assembly language after expanding and further developing the Cobol course now offered at the high school. Courses in RPG, BAL and unnamed "other languages" should be considered at the college level, the survey found.

Students moving up to the college should receive advanced standing for any DP course work they completed successfully in high school, the study group added.

The survey, completed early this year, involved mailing questionnaires to 275 area data centers and to every student who had attended a DP course either at the high school or the college. The 1971 membership directory of the Detroit chapter DPMA was used as a mailing list for the centers.

Questionnaires, returned by 34% of the centers, indicated the size of individual CPUs would be expanded by 1975, but that the number of separate CPUs would drop. The questionnaire did not specifically refer to the use of minicomputers and the respondents apparently did not mention the small machines in sufficient quantities for the study group to consider.

There will be a sizeable increase in the number of "operational terminal devices" during the next five years, according to the study, and the group recommended the use of conversational terminals and a course in data communications at the community college.

THE BELL SYSTEM HAS 13,000,000 MILES OF DIGITAL COMMUNICATIONS CHANNELS, AND IS ADDING TO THEM AT THE RATE OF 8,000 MILES EVERY DAY.

If this is welcome news to you in the data field, good. But our purpose is broader. Our purpose is better service for all Bell System customers.

You see, we have one fully integrated network. It has both "analog" and "digital" channels...and has had for many years. Signals travel as waves on one and as pulses on the other. Regardless of the original source or form of the signal, whether human voice or computer, we readily transform it to travel over either channel.

This flexibility makes virtually all of our network available for data transmission. It keeps charges low. And it gives us alternate routes should trouble arise.

Then why are we going heavily digital? Because with modern electronics, especially solid-state circuitry pio-

Quality Books Justify DP as an Academic Discipline

The fifth edition of the *Computing Newsletter's* bibliography of computer books is now available through the University of Colorado.

More than 200 books were published last year, expanding the bibliography by 20% over the prior edition. The fifth edition contains more than 800 books from 123 publishers.

Each book was reviewed and categorized according to type, text, reference or handbook and style, programmed instruction, case method, readings, or normal presentation.

This bibliography is important both to educators and practitioners as it demonstrates the validity of the discipline.

In some schools there has been opposition to establishing computer related degree programs, in either business data processing or computer sciences. There are questions as to breadth and depth in justifying an academic discipline.

I would be the first to agree that the increased quantity of books adds little to the argument for academic stature. However, in the past two years the quality of books has increased measurably. This is especially true of the books in business data processing.

J. Daniel Couger On Education

The computer science field has had some high quality books since inception. The business data processing field has had spotty quality over the years.

The following are examples of quality books published last year:

- *Systems Analysis and Policy Planning*, by Quade and Boucher
- *Computer Simulation Models*, by Emshoff and Sisson
- *Introduction to Systems Cost Effectiveness*, by Seiler
- *Advanced Programming*, by Katzen
- *Mass Information Utilities and Social Excellence*, by Sackman
- *Computers: A Systems Approach*, by Chapin
- *Computing: A Second Course*, by Gruenberger.

While the quality has improved in all areas, significant improvement occurred in two major catagories: systems analysis, and computers and society.

The proliferation of Cobol and Fortran books continued with more than 10 books added in each language. The bibliography includes a section on APL for the first time. The sections covering applications of the computer increased more than 70% over the prior year.

The bibliography has been restructured for quicker referencing, and it now contains 15 major classifications and 45 subclassifications.

Copies of the bibliography are available for $3 from *Computing Newsletter*, University of Colorado, Cragmor Road, Colorado Springs, Colo. 80907.

Couger is professor of Computer and Management Science at the University of Colorado. He edits the *Computing Newsletter for Schools of Business*, published by the university.

neered at Bell Labs, digital transmission is better not only for data but for many other services as well.

Digital transmission is better because it eliminates many kinds of noise, thereby getting more information over the same size cable with greater accuracy.

Digital is clearly technology's best answer to many of America's future communications needs. It will benefit everybody, not just our data customers.

We have 13 million channel miles of digital now, and we have definite plans for the near future.

- For 1972, a new digital system that will operate at 6.3 megabits per second, four times the speed of our present all-digital lines.
- By the mid-'70's, initiation of private line service on an end-to-end, fully digital basis which will ultimately serve every major city in the country.
- By the late '70's, waveguide systems capable of thousands of megabits per second.
- By 1980, the Bell System's network will be four times its present size. A large proportion of it will be digital—enough to provide ample capacity to meet America's data-handling needs.

The American Telephone and Telegraph Company and your local Bell Company are continually working to improve service to business.

This time by increasing digital services to benefit all our customers.

Edu-Bytes

'Beat-the-Computer' Game Teaches Basic Concepts

NEW ROCHELLE, N.Y. – People bugged by computers can now overcome their confusion and frustration through a game called "Beat-the-Computer," produced by Quantra Development Corp.

The game has a programming board and card pieces that are moved by the players through a simulated computer system. "Beat-the-Computer" is designed to familiarize players with time-sharing, queues, disks, tapes, input output and sorting.

"Beat-the-Computer," costs $14.95, and is being introduced by Brentano's bookstores.

Teachers Show Terminal I/O With Projector From Sharp

OTTAWA, Ont. – Instructors can display input and output of an interactive terminal system on a screen or wall with a specially modified overhead projector from I.P. Sharp Associates Ltd.

The 2510T Teleprinter Projector uses a roll of Mylar onto which the input/output is typed by the terminal. Built-in tension motors keep the Mylar flat, and a forward-reverse control permits "instant replay" of the interactivity. The projector can be used with IBM 2741, Datel or Teletype Model 33 terminals, and costs $950 from Sharp at 320 Queen St., K1R 5A3.

Information Science Courses Listed in Asis Directory

WASHINGTON, D.C. – The first edition of the *Directory of Educational Programs in Information Science*, listing more than 90 academic programs in U.S. and Canadian institutions, is now available from the American Society for Information Sciences (Asis), 1140 Connecticut Ave. N.W., 20036.

Information science is defined in its broadest sense by the compilers of the directory so that it includes courses in system analysis and management information systems, as well as library automation, management of technical information centers and computational linguistics.

The directory costs $4.50 for Asis members, and $5 for nonmembers.

ITS Console Reacts to Student

DOVER, N.J. – To provide realistic "hands-on" experience for student console operators without tying up user hardware, the Eduputer Program from Integrated Training Systems includes a mock-up of an IBM 360/30 console and a series of pre-programmed control cards.

Inserting the card into a special reader, the student attempts to complete his assigned exercise correctly. If he does, he will see the expected display on the console. The console, supporting tape recorded lessons and recorder, are available from ITS at P.O. Box 213, 07801.

Epoch 4's best salesman.

It's the 2420.

New, high-speed hardware has made the computer tape business a whole new ball game.

In fact, some conventional tapes are having a tough time keeping up with the new drives. They're supposed to. But they don't.

Epoch 4 does.

As a result, the 2420 sells a lot of Epoch 4 for us.

But, even if you don't have 2420's, you still need Epoch 4. For two good reasons.

First, Epoch 4 is the best tape you can use, right now, on any transport. Because its coefficient of head wear is less than four per cent of the industry average. Its modulus of toughness is 80 times greater. And it's the only tape in the business with a twenty-year warranty.

Second, there's the future. Sooner or later, you're going to upgrade to faster transports. 2420's, or something even faster.

Chances are, conventional tape won't perform properly on the new high-speed drives.

So, if you're buying anything less than Epoch 4 right now, your investment may soon be obsolete.

Think it over. Then try Epoch 4. It'll turn your transport into a super salesman.

GRAHAM MAGNETICS

Graham, Texas 76046

Random Notes

Software Development Costs Watched by 'Pecos' Service

ST. LOUIS, Mo. – Programming managers can control software development costs with the Project Evaluation and Control System (Pecos) available from McDonnell Douglas Automation Co., as a service on the company's time-shared network or as a package for installation on a 360/50 or larger CPU.

Printouts generated by Pecos include comparisons of actual to estimated performances, isolation of cost and schedule deviations, and detailed and summarized project status reports. A series of reports for higher management are also produced by the system, company spokesmen said.

Parameter Cards Define Output Of $1,000 Test File Generator

OAKLAND, Calif. – Users with a minimum 24K IBM 360/25 or larger CPU can create sequential files through parameter card entries used with the Profile/Test File Generator program from Computer Dynamics Inc.

The tape or disk files of test data may be organized in fixed block, or fixed or variable unblocked formats. The control cards used to define the file structure, also describe the fields, data content and variations. Written in Cobol, source code for the package is available for $1,000 from 100 Hegenberger Road, 94621.

Banks Handle More Accounts With Extended CIF from NCR

DAYTON, Ohio – Commercial Banks with large numbers of accounts can organize their records by depositor rather than be type of account, with an expanded verson of the Central Information File (CIF) available from NCR. The previous CIF was limited to 40,000 accounts, NCR said.

The larger CIF system, programmed in Neat/3, is capable of processing 11,500 accounts and 5,000 transactions per hour in its minimum configuration, which includes an NCR Century 200 with 64K memory, two disk units, card reader, printer and sorter.

Numerax to Up-Date Rate Files

ENGLEWOOD CLIFFS, N.J. – Shippers who need detailed and current data on motor carrier class rates can use the Accu-Rate data bank available from Numerax Inc. on a three-year up-date subscription basis. For "less than $10,000/yr", Numerax mails new data to users within 48 hours of the effective date of any increased rates.

Designed for use on IBM 360s, the Accu-Rate package includes a print program to generate hard-copy "ponies" or rate sheets for manual use. The data provided by the Accu-Rate file is guaranteed for accuracy, Numerax said from 467 Sylvan Ave., 07632.

CDC Plans 'Cyberloan' Service

MINNEAPOLIS, Minn. – Account management for branch offices of consumer finance companies will be made easier by the availability of Cyberloan service on the CDC Cybernet time-shared network, during the second quarter of 1972.

Cost of the Cyberloan service depends on volume of work processed and whether the terminals are leased or purchased.

Catalogs Job Streams

DOS Gains OS-Like Procedure Library

By Don Leavitt
Of the CW Staff

NEW YORK – DOS/360 operators can initiate execution of complete job streams, including JCL statements and program phases in simple or multiprogramming environment, without handling the JCL cards, by using the DOS Procedure Library System (D-Proc) software from Vital Computer Services.

Although independent of both the JCL processor and DOS, D-Proc functions like a bridge between the two. With the Vital package, DOS users catalog JCL job streams onto a unique disk based library similar to the OS Procedure Library.

Any of the cataloged streams can be readied for execution by requesting them, by name, through the console typewriter. After the request has been made but prior to execution of each phase, the operator has the ability to modify the JCL.

While D-Proc is designed principally to avoid JCL card handling, it is flexible enough to accept cards from the card reader as well as cataloged job streams from the procedure library. JCL cards in the reader may be intermixed with other cards so that users do not need a second reader dedicated to JCL entries.

The JCL entered through the reader may be for any of the three partitions available under DOS. The system is capable of placing a partition's next job in the proper D-Proc queue for execution.

Alteration of JCL just prior to execution is facilitated by several D-Proc features. The operator need not, for example, identify the exact card and exact column on the card of a field he wants to change. On the console he may name the field he wishes to alter and D-Proc will scan the JCL until it finds the name the operator gave. It prints out the JCL statement till it reaches the field, then pauses to let the operator enter the new value.

If the operator knows that he will often be changing the I/O Assign statements at execution time, he may prepare them originally with long vertical marks (standard on the 029 keyboard) in place of the logical unit number. D-Proc will automatically print the Assign statement, up to the LVMs, and wait for the operator to complete the assignment.

D-Proc requires no more core than JCL and does not add any overhead to the partition in which it is operating, since it overlays itself with the next program phase to be executed as soon as the JCL modifications have been completed.

It uses minimal disk space and can be purchased for $2,400 from Vital at 18 E. 41st St., 10017.

Batch Interrupt and CRT Facility Added to System 2100 Software

DALLAS – Software features recently made available to users have made the System 2100 key-disk-tape data entry equipment more flexible than before, according to the developer, General Computer Systems Inc. (GCS).

The software is part of a new GCS system which can use CRT keyboard terminals as well as the hard-copy terminals that made up the original System 2100. The new support allows 64 terminals, either local or remote, to use one system, GCS said.

A re-entry capability allows an operator to interrupt the entry of a data batch for any reason and later to continue the batch at the point of interruption.

Verficiation and editing routines have been strengthened. Multiple verifications can be performed on any data. In both verify and reverify modes, the user may add, replace or delete records.

Editing by character as well as by field is possible with the new software. Edits may be performed and the operator notified of any error as each character is entered.

The new system also includes dynamic reallocation of the intermediate disk storage space, to allow more efficient use of the disk for data coming from the entry stations.

GCS is at 12011 Colt Road, 75230.

Fortex 'Datatrieval' Has Sort

CHICAGO – Datatrieval from Fortex Data Corp. is a load-and-go system that permits sorting and mathematical operations to be performed on data extracted from tape or disk files before it produces a printed report, formatted to the user's specifications.

Since it is parameter-driven, Datatrieval is said to be an excellent tool for reports in which specifications vary from one cycle to the next.

Written for use on the IBM/360 under either OS or DOS, the Fortex software provides extensive formatting logic, including a self-centering report title and up to three lines of column headings. The system will provide detail or group printing and automatic page skipping, which may be triggered after a user-defined number of lines have been printed.

Datatrieval is said to support nine different types of sub-totals, and to print all data in edited form as specified by the user. Literals may be used as labels on the reports or as factors in any of the mathematical computations that can be done.

Written in Cobol, Datatrieval utilizes a minimum of 48K bytes of core on a 360/25 or larger CPU. OS and DOS/360 versions are available separately, as is one adapted to the RCA Spectra 70.

The package costs $6,000 and is available now from Fortex at 230 N. Michigan Ave., 60601.

Receivables Handled On-Line By Package From User-Vendor

FARMINGDALE, N.Y. – Designed for use with IBM 2260 CRT and 2848 or equivalenf terminals, the On-Line Accounts Receivable (Olar) package from Fairfield-Noble Corp. includes logic to prevent unauthorized personnel from either viewing or altering open items.

Olar accepts batched lock box remittance infomation consisting of check number and amount paid, as well as account identification, so that out-of-balance situations can be easily traced.

An unlimited number of accounts and open items are handled by the systems which permits users to define restrictions governing chargebacks, write-offs and reconciliations.

In addition to accepting data from the CRTs, Olar accepts sales information from tape, cards or disk, and calculates earned cash discount and anticipation discount on each sale.

The package also generates accounts receivable general ledger entries. Currently operational in 32K bytes of core on a 360/25 or larger CPU, Olar uses two disk drives and runs either DOS or OS/360. It costs from $20,000 to $25,000 and is available now from Fairfield-Noble at 333 Smith St., 11735.

ICP Fact Sheets List Users

INDIANAPOLIS, Ind. – Subscribers of the ICP Quarterly software review are able to get more detailed information about individual programs through the Software Product Fact Sheet service now available from International Computer Programs Inc., 2511 E. 46th St., 46205.

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First Transmitting Site

MCI Users Being Connected to Hancock Terminal

By Ronald A. Frank
Of the CW Staff

CHICAGO – As MCI continues to provide service to its first group of data users [CW, Nov. 10] its engineers and technicians are smoothly firing up more than $3 million worth of communications equipment.

The major MCI terminal point and a future key distribution point in its projected national network is located in the John Hancock Center, the tallest building in the city.

The MCI transmitting equipment is installed on the 97th floor under tight security resembling a military site. The only access is through a special key-operated elevator and a double-locked door.

Once inside, the impressive array of equipment is almost overshadowed by the breathtaking view of the city stretching out in all directions.

As John Roush of MCI's marketing staff described the operation of the various units in the installation, he was interrupted by technical chatter in the background.

Communications

"Those are engineers talking between the nine tower sites in the Chicago to St. Louis link," he explained. It turned out that Elkhart was talking to St. Louis about fine tuning one of the available operating channels.

The actual connections from the analog loops supplied by Illinois Bell to MCI lines is relatively simple but impressive. On the left of a large board identifying all the incoming wires is the Bell service terminal.

From the left side of the board, about 10 wires run overhead to similar rows of terminals on the right side of the board. These wires interconnect MCI's first users.

From the connections on the service terminal board, each user's signal is fed through a system frequency division mutliplexer that will ultimately handle 2,700 voice channels. The floor-to-ceiling unit is built by Northern Electric in Canada. Right now it can accommodate 300 channels.

Key Points Monitored

An important unit in MCI's Chicago terminal is the Collins 101 Link Analyzer CPU that continually monitors the quality of key points in the MCI Chicago to St. Louis route. Only 12 of the 101s are currently in use, according to Jerry Onken, the Chicago terminal manager, and 10 of them are operating at Bell System sites.

Actually the MCI staff makes very few references to the telephone company. Whenever the subject comes up, MCI people are very complimentary about Bell's services and efforts. They invariably see MCI as supplementing rather than replacing the telephone company.

The heart of the MCI Chicago installation is the Raytheon KTR 3A transmitter that pumps users' signals through nine repeater stations to the St. Louis terminal. The KTR 3A has complete back-up, Onken said, to guard against any loss of circuits.

Another back-up capability is contained in the storage batteries located in a corner of the tower site. The Hancock building engineers told MCI it had concentrated about five tons of weight in the corner. The equipment was dispersed to prevent any problems. "We can run for 12 hours without outside power if necessary," Dan Reising, MCI engineer said.

Asked about the level of maintenance that MCI users can expect, Charles Popp, technical director of operations shook his head. "There won't be any." All modems and multiplexers being installed by MCI have self-test features that make it possible to isolate trouble almost immediately," he explained.

If malfunctions do occur, Popp said, MCI will be able to reach a user in about an hour. "We will stock spare equipment," he said, "and rather than keeping the user off the air while we do on-site repairs, we will simply give him a spare modem or whatever he needs."

Repairs will be handled at a maintenance center and warehouse to be established in Joliet, outside of Chicago, Popp said. "Most of our malfunctions will require replacing printed circuit boards," Popp predicted.

Although MCI will be dependent on local telephone companies at first, future plans call for local or "short hop" microwave equipment to tie users to MCI terminal sites.

This will allow users to eliminate data sets and give them an all-digital transmitting capability. The first MCI users will have to use modems only because the Bell-supplied local loops are analog.

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Users Can Help MCI Get State Tariffs Approved: Goeken

CHICAGO – Although MCI has begun serving its first data users, available services are still limited. MCI president John Goeken said users will play a large role in deciding how soon MCI is able to expand.

The first Chicago to St. Louis facilities can serve only users who transmit on the entire route, Goeken explained. Users who want to transmit data on only a portion of the link will have to wait until MCI gets intrastate authorization from the Illinois Commerce Commission.

Asked whether this would present any problems, Goeken said it will depend on how the commission receives MCI's proposed intrastate tariff. The filing will take place before the end of November, Goeken said.

Goeken said it will be difficult for the state regulatory agencies to delay approval if they see that users are waiting for MCI's type of service.

"Users should be aware of our regulatory procedures and write to the various commissions to approve our filings. This will help to overcome any remaining opposition," Goeken said.

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RECORDING CHARTS | GRAPHIC CONTROLS CORPORATION BUFFALO, NEW YORK

Graphic Controls announces the first second source of supply for plotter recording charts.

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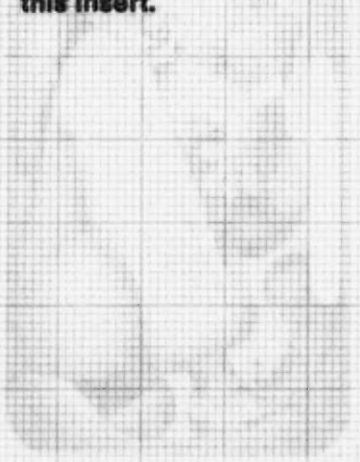

RECORDING CHARTS | GRAPHIC CONTROLS CORPORATION BUFFALO, NEW YORK

Telex Offers 3330-Type Disk, First 3410-Type Drive

By Frank Piasta
Special to Computerworld

TULSA, Okla. – Telex is the first independent supplier to offer magnetic tape drives compatible with the IBM 3410/3411.

Telex also has announced a disk storage subsystem intended to replace the IBM 3330, offering equal or better performance levels at a lower price.

The tape system, called the 6410/6411, is offered in three models with tape speeds of 20-, 40-, and 60 in./sec, compared to speeds of 12.5-, 25-, and 50 in./sec offered by IBM.

Data transfer rates of the Telex drives are 32-, 64-, and 96 kbyte/sec compared to 20-, 40-, and 80 kbyte/sec for the IBM devices they are designed to replace.

The Telex units also differ from the IBM drives in offering up to two drives and the controller in a single cabinet. The IBM units offer either a tape drive, or a combination of tape drive and controller.

A single Telex controller can handle as many as six tape units.

The Telex drives, however, differ from their IBM counterparts in offering connection to the IBM 360 and 370 only. The IBM drives are available for the System/3 small business system as well.

Although prices of the Telex drives were not revealed, the company said they would be at least 10% below those charged by IBM. First deliveries are scheduled for the fourth quarter of 1972.

Disk System

The Telex 6330 disk storage subsystem consists of a 6830 control unit and from one to eight 6316 disk storage units. The drives use the same 3336 disk pack used on the IBM 3330 and provide full pack and data interchangeability with the IBM machine, giving a capacity on-line of from 100- to 800 Mbytes.

Average access time of the Telex drives will be equal to or better than the IBM figures of 30 msec. The track-to-track time for the Telex unit will be better than that of the 3330, according to a Telex spokesman.

Exact prices for the 6330 have not been set, Telex said, but will be at least 10% below those of the IBM 3330. First deliveries are scheduled for the third quarter of 1972.

Mohawk Key-Display System Has CRT, Based on 2400 Peripheral Processor

HERKIMER, N.Y. – Mohawk Data Systems has used its 2400 Peripheral Processor system as the basis for two new key entry systems. The systems, known as 2400 Key-Display systems vary in capability depending on whether the 2404 or 2405 processor is used.

All feature a keystation equipped with a 5- by 7 in. CRT as well as a keyboard. The 240 char. scope is called "tutorial" in its use, guiding and instructing the operator. It shows record formats, start and end-of-job procedures, error conditions and status information, all in "plain English."

All communications between the operator and the systems take place through the scope, eliminating the need for toggle switches, Mohawk said.

Mohawk Data Systems 2400 Key Display System

Up to 20 keystations can be attached to the 2404 processor which can be equipped with up to 56K bytes of memory. The processor uses a turnkey, real-time operating system that controls the performance of each keystation. One or more fixed-head 2.4 Mbyte disks are used for intermediate storage for edited records, from which they are transferred to one or two magnetic tape drives under supervisor control. A line printer is optional.

A communications option allows the system to carry data bursts from the tapes to another 2400, or terminals that use binary synchronous transmission. including the Univac 1004, DCT-2000, IBM 2780 and others, at rates from 1,200 to 9,600 bit/sec.

The cost of the system depends on the size of installation and can range from $140/mo per station for an eight station system to $120/mo per station for 20-stations.

The use of the 2405 processor amounts to adding a key-display system capability to Mohawk's peripheral processor system. In addition to handling as many as 10 entry stations, the system can operate in all of the peripheral processor modes available on the 2400, but not simultaneously.

Data can be converted from one medium to another with editing; magnetic tape files can be sorted; multiple printers can be operated and communications at rates as high as 48 kbit/sec can be handled. Cost of the additional equipment to adapt a 2400 Peripheral Processor system to use as a key-display system is about $140/mo per station.

First deliveries are scheduled for April, 1972.

POS System Includes Terminal Choice

HUDSON, Mass. – Datatrol, Inc. has developed a minicomputer-based turnkey system for retail credit authorization and information that offers the user a choice of display or audio response terminals.

Called the Credit System-1500, the system provides automatic credit verification and authorization, including account number and dollar entry, in less than 15 sec, according to the company. Stores can institute a "zero floor limit" without slowing credit transaction, Datatrol said.

Based on a DEC PDP-8/E with 12K words of memory, the system includes one or more 640-char. CRTs for use in credit offices, a 25 in./sec IBM compatible tape drive, one or more Teletype ASR 33s and disk files. The disk files used will depend on the size of the system. A small installation will use the Diablo cartridge disk with 24 M-bit capacity, while large systems will be equipped with the Memorex 660, compatible with the IBM 2314.

All needed software will be provided by Datatrol. This will include program for real-time, on-line functions from point-of-sale and from the credit office as well as for updating, gathering of statistics, and start-up procedures.

The point-of-sale terminals used with the system will depend on whether an audio-response unit is included. With the VS-1400 audio-response unit, the terminal consists of a Touch-Tone pad. A display terminal, made by Datatrol, which uses a series of lights and a numeric display can be used in high traffic areas.

The system uses a store's standard telephone line system, including tie lines in case of branch operations, plus leased lines.

The CS-1500, Datatrol said, is adaptable to any system likely to be developed in the future. If, for example, credit authorization is to be made a function of the central EDP system, the company explained, the system can be used as a front-end concentrator.

Prices for a complete system, including software, range from about $1,500/mo for a 50-terminal system to over $8,000/mo for a system with 1,000 terminals. Delivery time is four months, from Kane Industrial Drive, 01749.

Potter Printer, Printer/Plotter Interfaced to DEC PDP-8 Mini

MELVILLE, N.Y. – Potter Instrument Co. has extended its line of plug-to-plug compatible devices into the minicomputer area with its announcement of a line of printers and printer/plotters for the DEC PDP-8.

The devices are based on the 3000 series of printers which has been offered as an OEM product by Potter for some time. They use a novel approach, based on a rotating helical scanner with voice coil actuated hammers. The approach, which eliminates the need for character drums or chains, results in reliability standards unmatched by any other manufacturer, Potter said.

The LP 3008 and LP 3308 line printers operate at speeds of 135- and 300 line/min respectively. Each unit has a multiple copy capability and uses 64 characters and 132 columns. Other character sets are available and can be replaced by the exchange of a single IC module.

The LP 3058 and LP 3358 printer/plotters can plot 14,784 and 32,340 point/sec, respectively. Line printing characteristics are similar to those of the LP 3008 and LP 3308. The units operate with standard fanfold or multi-part forms and provide a plotting width of 13.2 in.

Each unit is supplied as a fully buffered device, self-contained in a pedestal cabinet. It comes complete with interface, cables, and modified PAL II and Symbolic Editor.

Prices start at $6,000. The devices are available on a 12-week delivery schedule.

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HP Adds Time-Sharing System/3000

PALO ALTO, Calif. – The Hewlett-Packard System/3000, a disk-based computer system using a new 16-bit processor, is intended to simultaneously handle time-sharing, real-time, multiprogrammed batch and on-line terminal operations, each in more than one computer language.

The system architecture provides for efficient dynamic allocation of resources and provides for concurrent I/O and CPU operations, HP said.

The central processor hardware provides inherent reentrant code, relative addressing, memory protection and virtual memory through variable length code segmentation.

The addressing flexibility provided by the hardware stack design of the central processor makes possible a set of 170 instructions including hardware floating-point as a standard feature.

Main memory is available in capacities of from 32K to 131K words in four modules and has a cycle time of 950 nsec. A microprocessor, based on an LSI ROM with an instruction time of 175 nsec and a capacity of 4K 32-bit words, is featured.

Disk files are used for mass storage. A removable pack drive with capacity of from 5- to 50 Mbytes is available with an access time of 42.5 msec. Fixed head disks with a capacity of 4 Mbytes and an average access time of 8.5 msec can be attached. Also available is a 5 Mbyte cartridge disk with a 47.5 msec cycle time.

The system also provides an asynchronous multiplexer and synchronous interfaces for data communications. It is compatible with Datapoint 3300 CRT terminals and can be used with Bell 103 or 202 data sets, but HP said any EIA-232 type terminal can operate with the new system.

In addition, the System/3000 can be used as a front end to an IBM 360.

The HP System/3000 is controlled by the Multi-Programming Executive (MPE). This operating system uses a multi-level priority structure to determine the execution sequence of tasks regardless of the order in which they were entered.

Now scheduled for demonstration early next year, MPE is being developed along the lines of the Master Control Program (MCP) used by Burroughs to control its B6500 CPU, according to HP.

In addition to extended Basic and extended Fortran capabilities, HP has developed an Algol-like Systems Programming Language for use with the new hardware. A Cobol compiler is expected to be available "before the end of the year."

A minimum configuration of the System/3000 including a processor with 32K bytes of main memory, a 5 Mbyte disk file, communications multiplexer and console will sell for about $100,000. First deliveries are scheduled for August, 1972.

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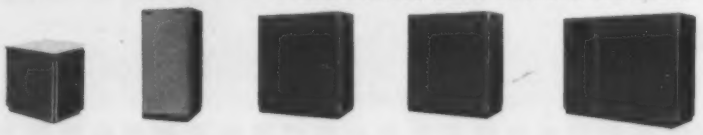


Bits & Pieces

Realtime Business System Tailored to User's Needs

RIDGEWOOD, N.J. – The Immediate Response Application System (Iras), from Computer Covenant Corp. is a real-time, multi-terminal minicomputer system that can be tailored to a user's requirements.

Applications include inventory control, order processing, reservation systems and point-of-sale systems.

The system consists of a low-cost dedicated minicomputer, terminal and batch interactive operating system, and application programs customized to the user requirements.

A basic Iras system with five CRTs, 48K byte processor, 22 Mbytes of disk storage and Iras support leases for $2,600/mo. Delivery time is 90 days from 1156 E. Ridgewood Ave., 07451.

Low-Cost Teletype Replacement Uses Standard IBM Typewriter

POMPTON LAKES, N.J. – Said to be the lowest cost office terminal based on the IBM Selectric typewriter, the Holmes Tycom Model 38 KSR terminal from Terminal Equipment Corp. is intended to replace Teletype Models 33, 35, and 38.

It operates in Ascii at 10 char./sec and is intended for computer interaction, batch processing, remote data communications, form letter writing and source data entry.

The terminal offers upper and lower case characters, 110- or 130 char. print line, and interchangeable faces. Off-line, the unit can be used as a standard typewriter.

The Holmes Tycom Model 38 carries a price tag of $52/mo, excluding the cost of the typewriter. Deliveries will begin in 60 days from 750 Hamburg turnpike, 07442.

Desk-Top Magnetic Card Reader Usable With Minis, Terminals

PHOENIX – The Data Director from B Industries, Inc. is designed as a desk-top, general purpose I/O device for use with small computers and some keyboard applications.

The system substitutes magnetic tape striped cards for punched cards and provides a packing density of 556 bit/in. on an 8-track format for a total capacity of over 26 kbits on a 3-1/4- by 7-3/8 in. card. Higher capacity 8-1/2- by 11 in. cards are available.

The Data Director is self contained and interfaceable to any minicomputer or computer terminal, the company said. It is priced at $1,880 from 2202 W. McDowell Rd. 85009.

EMR Real-Time System Debuts

MINNEAPOLIS, Minn. – The 6145 Computer system is described by the manufacturer, EMR Computer, as an advanced, real-time system designed for data communications and message switching applications.

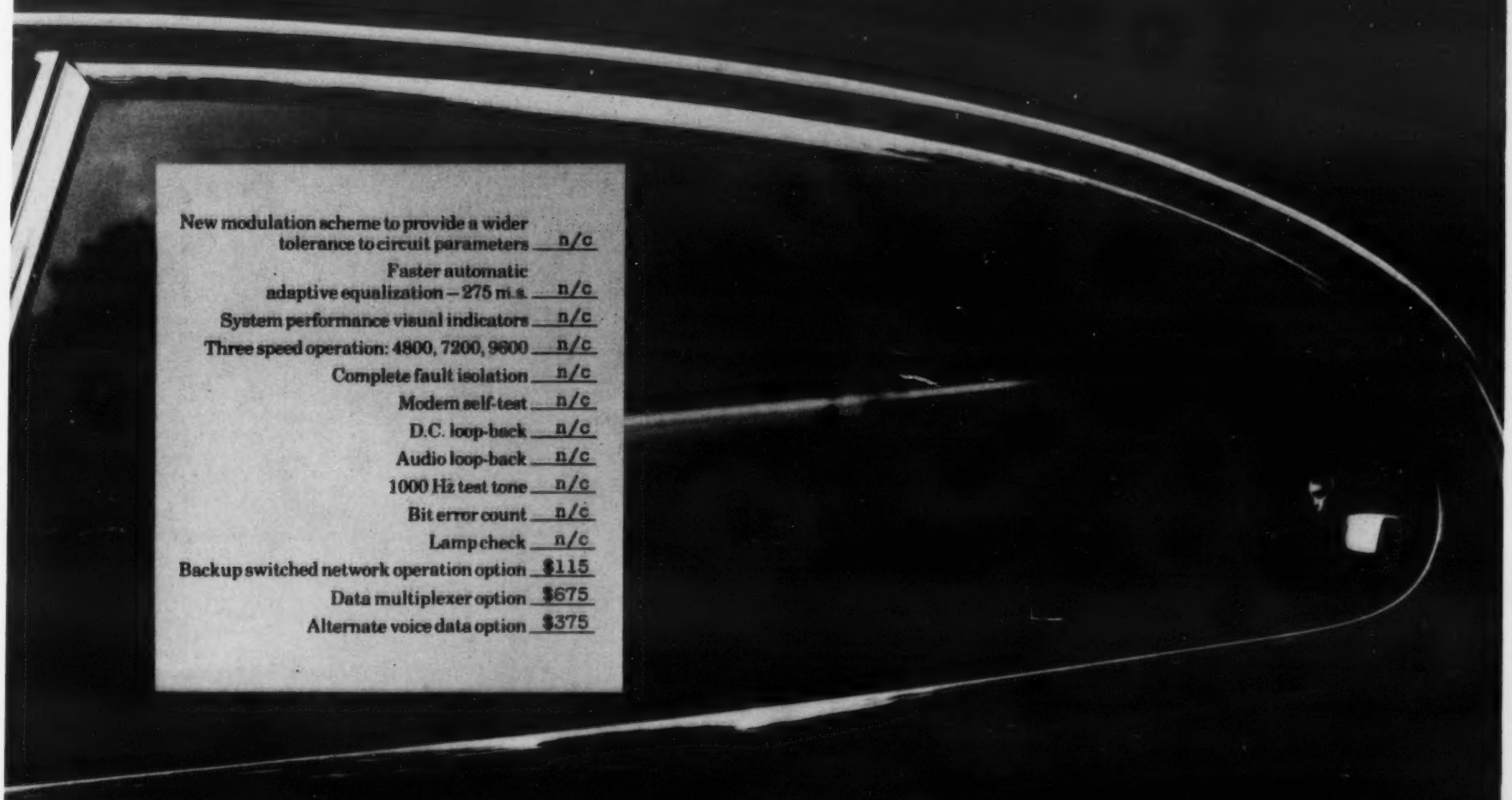
The 6145 was designed for dedicated single application and general purpose multi-processing. Due to a high degree of modularity and the availability of special application software and hardware, the company said, the 6145 can serve as a dedicated system.

The system offers single or dual processor configurations. Sixty-four individual interrupts and 16 levels of memory protection are available. Cycle time is 650 nsec. Up to 18 buffered channels are provided, with a transfer rate of 1.6 Mbyte/channel.

Software includes a real-time operating system, Fortran IV, an assembly language, and special applications.

Price of the basic 6145 processor with 32K memory and two direct memory access channels is $135,000. Shipments will begin in mid 1972 from 8001 Bloomington Freeway, 55420.

Codex introduces its new 1972 model high-speed modem. 9600 bps, more standard features than any other model and a warranty for 12 months or 300 billion bits, whichever comes first.



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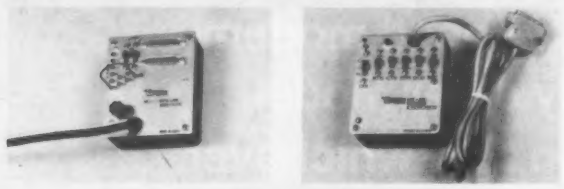

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Ampex Add-On Memory for IBM 360/50 Allows User to Triple Main Storage

MARINA DEL REY, Calif. – A plug-to-plug compatible add-on main memory from Ampex Corp. will enable 360/50 users to triple their system capacity.

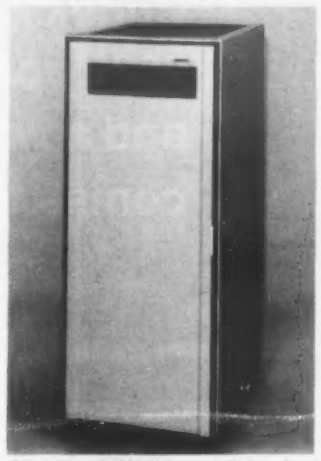
The Ampex ARM-50 is available in increments of 128K bytes at a cost that is 20% lower on a two-year lease than an equal increment from IBM. Maximum configuration on the Ampex memory is 1,024K bytes, which can be added to the maximum IBM configuration of 512K, Ampex said, for a total of 1,536K bytes.

Each 128K byte module carries a lease price of $2,550/mo. The IBM prices for increasing a 360/50 memory from 128K to 256K is $3,800/mo; from 256K to 384K, $3,410, and from 384K to 512K, $2,785. Ampex claims that its unlimited usage, in contrast to the overtime charges levied by IBM, can save the user up to an additional 20% of the rental rate.

The user, Ampex points out, can reduce his 360/50 configuration to the minimum of 128K allowed by IBM and substitute the Ampex memory units, resulting in a net reduction in cost for an equal configuration.

Ampex also manufactures extended core memories, replacements for the IBM 2361 Large Core Storage, for the 360/50, 360/65, 360/67 and 360/75.

The ARM-50 is available on a 60 day delivery schedule.



Ampex ARM-50 module has 128K capacity.

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Paper Tape Reader Interfaced to Nova

LINCOLNWOOD, Ill. – Pivan Data Systems is offering users of Data General Nova minis a higher performance lower cost substitute for the standard paper tape reader.

The N105 couples a Tally R5000 7-Track Ascii Photoelectric Reader to an interface developed by Pivan that connects to a single subassembly slot in the Nova. The combination is compatible with the Data General software for the DG 4011B/4011 reader/controller combination.

In addition to the 300 char./sec forward incremental operation offered by the Data General device, the N105 offers forward slew, forward rewind, reverse incremental, reverse slew, and reverse rewind.

Operating speeds are 300 char./sec for incremental asynchronous operation, 500 char./sec for incremental synchronous, and 1,200 char./sec for slew. All operations can be run in either direction, in contrast with the Data General unit.

The price of the Pivan reader is significantly lower than the Data General device. The N105, equipped to read fanfold tape, is $2,195, compared to $2,650 for the Data General 4011B reader and 4011 controller. The Pivan, unlike the DG unit, offers a version that can handle 7-1/2 in. supply reels for $2,495, and an optional priority check for either model for $100.

The N105 is available on a 60- to 90-day delivery schedule from 6955 N. Hamlin Ave., 60645.

Incremental Cassette Drive Compatible With EIA Specs

DALLAS – The Portable Termicette Model 3300 incremental cassette recorder from International Computer Products, Inc. is EAI interfaced, making it compatible with any RS 232 modem, terminal, printer or computer.

The recorder, the company said, can be coupled to send-receive data terminals to provide off-line data preparation and batching, and high-speed on-line transmission and reception.

The Portable Termicette works at speeds of 110, 150, and 300 bit/sec. It is compatible with either half or full-duplex systems and does unlimited backspacing and forward spacing. A high speed search can be made to any record on the tape from either direction.

The price of the basic unit is $1,650. A remote control option, at $150, permits unattended operation. The Portable Termicette is available on a 60-day delivery schedule. The firm can be reached at P.O. Box 34484, 75234.

It's got a lot to say for itself.

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Configure your system any way you need it. As a large multi-purpose peripheral system, as shown here. With keyboards added on to your present System 2400 processor. Or as a dedicated cluster system for volume entry.

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2431, 2433, 2435	Magnetic Tape Handlers
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2446	Drum Printers
2452, 2453, 2454	Card Readers
2457	Card Punch
2458	Card Read/Punch
2467	Punched Tape Reader
2471	Disk Drive
2491	Key-Display Module
2493	Teletypewriter

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Key entry routines to be used by non-computer staffs.

Communication routines to emulate capabilities of the more popular IBM, Univac, CDC and other terminals.

Compilers: Mohawk Data Language (MDL) and RPG II.

Utilities: Media conversion; tape sort/merge/print station emulation; correspondence composer; tape pool/spool; data processor.

These lists are *not* exhaustive. See your MDS man.

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On-Line System Times Rowers

CAMBRIDGE, Mass. – Oarsmen competing in the recent Head of the Charles Regatta were surprised to see computer terminals at the start and finish lines.

Located on the roof of the Boston University boathouse and under a tent on a bank of the Charles River three miles upstream, their use facilitated immediate computation and posting of race results for 314 boats.

Patterned after "Head" races held in England, each boat is started individually, about 10 seconds apart. Times of boats crossing the start and finish are recorded and calculated, and the boat with the shortest elapsed time wins.

Since boats frequently crossed the finish line within 1 second, times were entered on the on-line terminal by depressing the "return" key. The operator entered corresponding bow marker numbers in sequential order when there was time.

The computer matched these up, and results computed after each race were printed out on

This was the view across the finish line.

terminals at the host organization, Cambridge Boat Club, and at the starting line.

Formerly, couriers transported stopwatch times from the start and finish to the boathouse, where they were compared and calculated manually.

In the past, a group of workers spent many nights reading clock times on photographic negatives doublechecking the elapsed time.

This year official results were available the day after the regatta.

Programming for the regatta was done by Cambridge Boat Club member and competitor, Chuck Roth. Time on a PDP-10 for work in conjunction with the regatta was arranged through First Data Corp. of Waltham.

Although the system was generally termed a success by regatta officials and competitors, a couple of snags occurred. In one instance, the operator at the start broke the phone connection to the computer to call for oil for the starter's launch, and had difficulty getting a adequate phone connection afterwards.

boat started out of order, when another boat's number was already typed and ready to be entered. Instead of making up a fake 3-digit number, the operator "corrected" the error by inserting the other boat's number, and a 4-digit number was invalid.

When the finish terminal started printing garbage between events, the trouble was traced to the phone cord flapping in the wind. Securing it solved that problem.

But the timing committee was prepared and had a videotape system and manual stopwatches for backup systems.

The computer was also used to typeset the program listing over 1,100 oarsmen representing 314 boats in 16 events.

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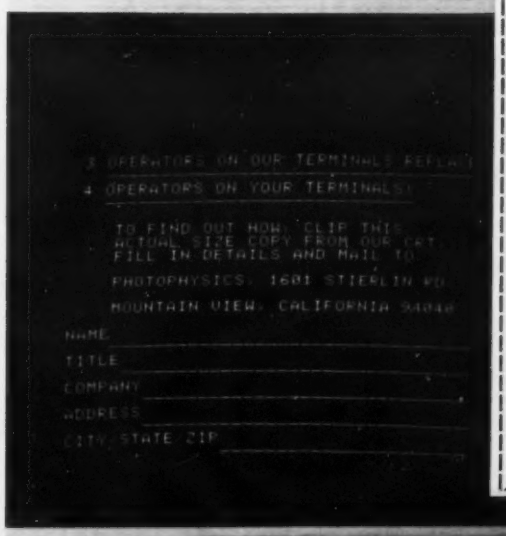

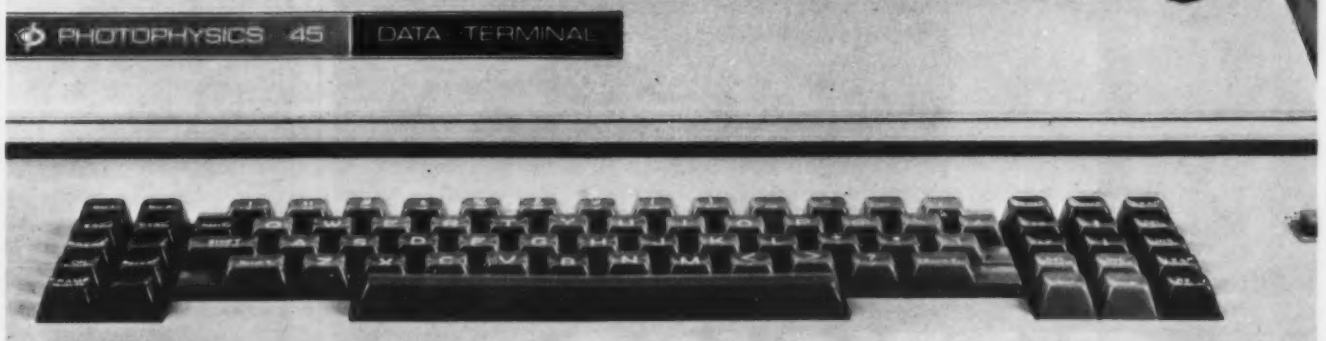

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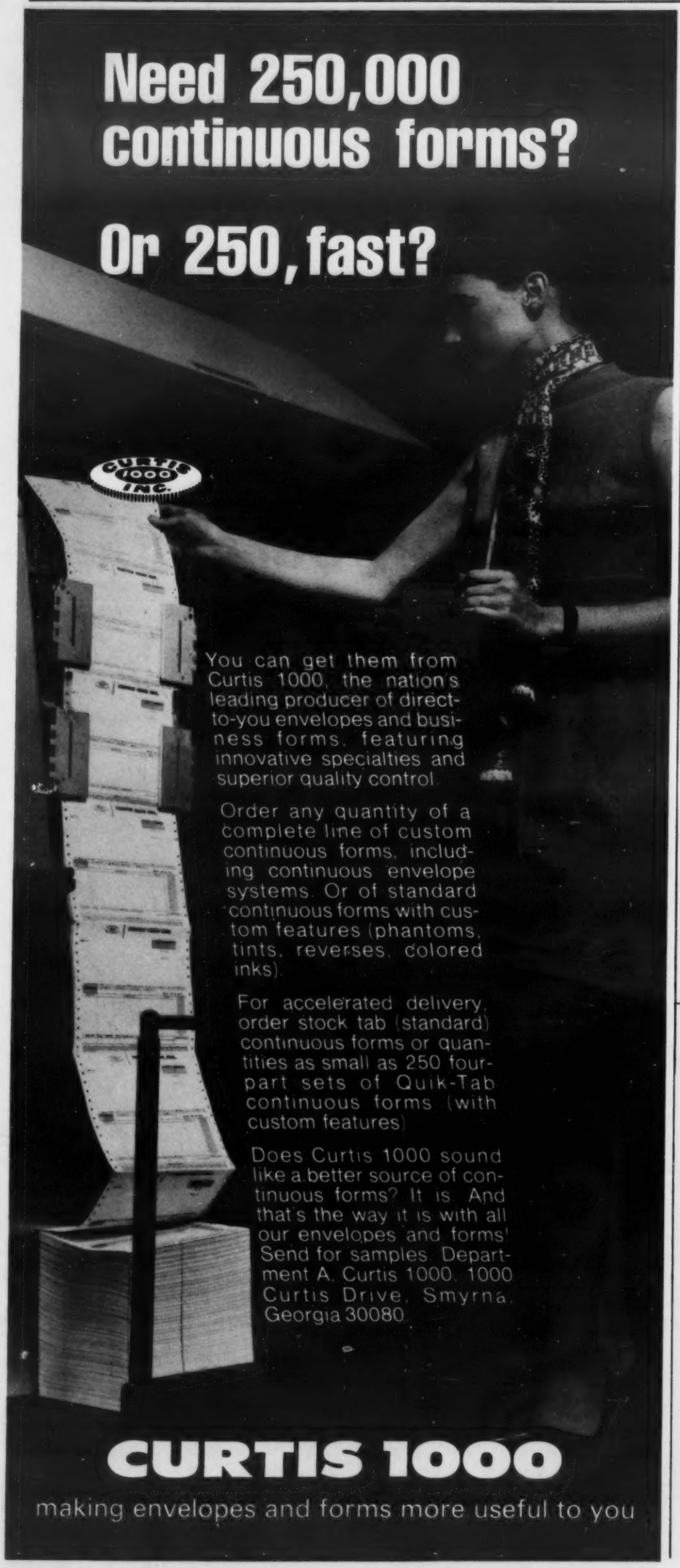


Four Systems Update Tote Boards at NY Race Tracks

NEW YORK – Racing is both a sport and big business. The New York Racing Association (NYRA) is betting that its computerized "tote system" will keep it in the winner's circle.

Computers, linked through an electronic network to all ticket-issuing machines and tote display boards, are used to update and post, every 90 seconds, the odds and dollars wagered on each horse to win, place or show, plus exactas and daily-doubles. Pay-offs are calculated and posted simultaneously with the official results of each race.

Automatic Totalizers, which operates the parimutuel operations, uses four Honeywell Model 2200 systems to process an average of $4 million each racing day at NYRA's three tracks: Aqueduct, Belmont and Saratoga.

Parallel Systems

Two of the computers operate in parallel and simultaneously as bets are being placed before each race, processing and comparing information on every bet, computation and result.

A third is on standby duty, ready to be switched instantantly into the system in case of equipment failure. The fourth computer is set up at the site of the next scheduled race meeting.

The parallel systems operate in an instant-response mode that is capable of handling 1,100 bet/sec from more than 550 ticket-issuing machines at each track.

The computers also are handling New York City's off-track betting requirements, collecting bet information on magnetic tape and feeding it into the system to expand the parimutuel pool.

Portable Systems

Each of the four computerized tote systems is portable, so they can service all three NYRA tracks. At the conclusion of each track's race season the systems are disconnected, packed and shipped. In less than 48 hours, two complete systems installed at the site of the next race meeting are ready to handle betting.

Such transfers are repeated five times a year as racing shifts from one NYRA track to another.

Crab Fishermen's Businesses Saved By Computer Loans for Boats, Bait

PORT ROYAL, S.C. – The independent crab fishermen of the southern South Carolina coast, whose fishing methods have changed little in hundreds of years, have found a new ally in a modern day computer at Port Royal's Blue Channel Corp.

Crab fishermen's livelihood depends on the daily catch of crabs, but they often lack the financial resources to get into business or, when the crab catch is low, to stay in business.

To meet this problem, Blue Channel, a processor of crab and fish products, is helping independent crab fishermen by providing loans to buy boats, motors, bait and crab pots.

When a fisherman brings in his catch, its value is recorded in the company's computer and part of his proceeds are credited to his loan expenses. Once the boat and motor are paid for, the loan can be continued as an expense account for bait and gasoline, with the computer keeping track of the individual fisherman's expenses on a day-to-day basis.

The company also hopes to use the computer, an IBM 3/10, to determine trends in crab catches along the southern South Carolina coast.

Often Forgotten Satellites Still Transmitting Space Data Home

GREENBELT, Md. – They resemble giant paddlewheels, basketballs, and sometimes even spiders as they orbit earth and collect information day and night on cosmic rays, radiation from the sun, the earth's magnetic field, and many other areas of investigation.

Few people give a passing thought to the strange-looking scientific satellite, but the knowledge from these outposts in the sky keeps growing, as one of the world's most advanced data processing installations reduces their telemetry data into proper form for study by scientists.

The satellite installation, the Telemetry Data Processing Facility handles over 15,000 magnetic tapes received each month from data acquisition stations in Nasa's Satellite Tracking and Data Acquisition Network, Stadan.

The tapes contain telemetry data from such satellites as OGO (Orbiting Geophysical Observatory), OSO (Orbiting Solar Observatory), IMP (Interplanetary Monitoring Platform), and Isis (International Satellites for Ionospheric Studies).

From 3 to 22 Experiments

The number of experiments on a satellite varies from three on a Radio Astronomy Explorer detecting radio waves from outer space with 750-ft antenna arms to as many as 22 on an OGO studying earth-space relationships.

Within the facility, a Univac 1108 multiprocessor computer system reduces data from 15 of the satellites.

The system, an advanced earth support base for these instrumented space platforms, operates programs which separate the information from each satellite into completely organized form. The common channel of telemetry from each satellite is finally decommutated, or converted to individual outputs for separate experiments.

The computer's extensive functions may also include showing data as a function of time and latitude, making time corrections, determining the satellite's attitude, and many editing and data evaluation tasks.

Goddard's Univac 1108 multiprocessor includes two processors and one input/output controller. It is operated by the center's Information Processing Division, which is responsible for initially processing data from the scientific earth-orbiters.

4,000 Tapes per Week

The computer handles about 4,000 tapes received each week from Stadan. When a tape arrives at Goddard, it is evaluated and entered into the data accounting system. The information on each tape is then converted from analog to digital form, the time is decoded, and the data is edited to measure data quality and reduced by the 1108 to more useful form.

The 1108 system may also handle real time data received by microwave link directly from the data acquisition antennas. This is the usual procedure for experiments during the critical first two weeks of a mission.

When animal experiments are included, as they were on the Orbiting Frog Ogolith and the monkey-carrying satellites, the 1108 handles data in real time throughout the mission.

'95% Reliability'

"Our multiprocessing installation has been extremely successful, with better than 95% reliability," said Dr. George H. Ludwig, chief of the division. "Since installing the multiprocessor, we have achieved a 40% increase in throughput over the two previous unit processors," he added.

A team of eight Goddard and two Univac personnel achieved the converson using Univac's Exec 8 operating system.

Advantages, according to Dr. Ludwig, include:

- Two processors sharing resources for greater economy
- Increased efficiency through simultaneous batch, real time, and conversational processing
- The system can support future requirements for increased on-line processing.

The installation includes two Fastrand II mass memory subsystems, a dual channel FH-1782/FH-432 drum subsystem, 33 Uniservo VIII-C magnetic tape units, a communications subsystem with a variety of terminals, three vector displays, two printers, two card readers, and two card punches.

The data from this facility is forwarded to approximately 250 scientific investigators.

Study Shows Successes

MIAMI, Fla. – "Hopes of the 60s for the use of computers in corporate management are being realized in the 70s. Major companies are now relying on computers for actual operations and are doing it successfully," Andreas H. Kruse, Director of Client Services, The Diebold Group, Inc. said recently at the 26th meeting of the Diebold Research Program.

Research findings of computer use in the marketing, financial and manufacturing aspects of corporate operation were described.

Advanced computer usage in marketing management was illustrated by companies with total order fulfillment programs totally dependent on the data processing system.

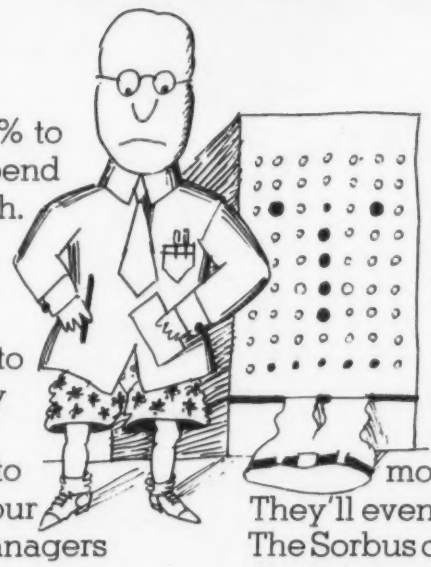
One corporation that has established profiles of individual names can actually sell an individual customer the specific item that he is interested in from the company's entire product line.

Speeded up information flow through the use of computers allows day-to-day financial management not previously possible.

The new cash management system allows effective collaboration between data processing management and treasurers and provides management with information on available cash rapidly enough to allow the most profitable utilization of cash resources.

Now in its seventh year, the program is an industry-sponsored continuing study of the impact of change in management and information systems on today's decisions and planning. It is conducted by The Diebold Group, Inc., an international management consulting firm.

It's a hell of a note.



Most 360 users waste 20% to 50% of the money they spend on core. Month after month. Year after year. And that, by anyone's definition, is one hell of a note.

Fact: CorPak costs 20% to 50% less than the memory that came with your CPU. And you're perfectly free to use it, whether you rent your 360 or own it. Some dp managers don't know that.

CorPak is plug-to-plug compatible with most 360's: Mod 22, 30, 40 and 50. It's built to military specifications, and it will match or beat the environmental specs on your CPU.

Reprogramming isn't necessary, if you use CorPak for same-size replacement of your present memory. If you increase core size, CorPak requires no more reprogramming than the other kind of memory. And it can give you up to twice the core that the mainframe manufacturer is willing to provide.

Factory teams install CorPak in as little as 2 hours and seldom more than 16, for even the most complex installation. They'll even do it over a weekend. The Sorbus organization services CorPak through 129 nationwide centers. They can have a man at your site within two hours of the time you call.

We want to show you how much you can save with CorPak. Call us collect. We'll set up an appointment at your convenience.

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COMPUTERWORLD

societies/user groups

Forms Industries Set User Confab, 'Maximize Investment' Is Theme

HOLLYWOOD BEACH, Fla. – The "imperative" for the seventies is "maximizing return on the EDP investment," according to the planners of the EDP user forum sponsored by the International Business Forms Industries.

Scheduled for the Diplomat Hotel here Dec. 5-8, the program will concentrate on case histories of successful DP usage, as well as companies which have failed to make EDP viable, according to Arnold Greenfield, chairman of the forum advisory committee.

One full day of the program will be devoted to selecting tools and components for the three major segments: input, processing, and output.

Concurrent panel discussions will deal with each topic in depth, including financial and managerial ramifications.

Registration fee is $195 per person, from the Graphic Communications Center, 1730 N. Lynn St., Arlington, Va. 22209.

Headquarters Takes DPMA '72 Reins, Chapter Sponsorship 'Null and Void'

By Edward J. Bride
Of the CW Staff

NEW YORK – Local sponsorship of next year's conference of the Data Processing Management Association (DPMA) has been declared "null and void" by international headquarters.

There will be no "host chapter," DPMA reported, and no "general chairman."

A. Anthony Pilla, New York chapter president, said funds had been expended for the past three years, promoting and planning the 1972 conference, and he wants headquarters to refund all money spent for that meeting.

No Request Received

R. Calvin Elliott, executive director, said he was "not aware" that the New York Chapter had been spending money on the 1972 conference, and no formal request for a refund had been received by headquarters, in Park Ridge, Ill.

The disassociation was ordered because "one or two individuals" were not following guidelines, he added, declining to name any particular rules, or the violators.

Elliott did say a "sizeable group" from the New York chapter would assist in planning DPMA '72, and that no sanctions would be taken against the individuals in question.

Any "threat" to the conference or to DPMA presented by the violations "did not materialize, did not develop," Elliott stated, emphasizing the formal sponsorship was dissolved because of "one or two individuals, not the whole chapter."

Pilla declined to elaborate on his announcement to chapter members, when he referred to the rules as "trifling dictates."

DP Lawyers Unite

WASHINGTON, D.C. – Lawyers gathered here recently for the "informal" establishment of the Computer Lawyers' Group.

Over 40 attorneys attended the initial meeting, and the group plans to reconvene next May, according to Chairman Fred S. Lafer of Automatic Data Processing, Inc.

The group will not have formal conferences, at least at this early stage, Lafer indicated, but is intended as an educational service to apprise members of current developments in liability, government procurements, and software protection.

"This is a rapidly evolving field," Lafer said, "and we need to establish lines of communications."

Attorneys interested in attending the next meeting or in obtaining information may contact Robert Bigelow, Esq., Room 2200, 28 State St., Boston, Mass. 02109.

Hospitals 'Seek' DP

SAVANNAH, Ga. – Hospital computer users will evaluate the "in-house or shared time?" decision during a panel discussion at a two-day seminar sponsored by the Systems Evaluation and Exchange of Knowledge (Seek) group next month.

The panel will mark one of the few times a group of experts has been assembled to discuss this "major factor in modern hospital planning," said Robert J. Marsh, Seek president and administrator of Candler General Hospital here.

The panel will take place here Dec. 2, opening day of the seminar, at the DeSoto Hilton Hotel. Hospital administrators and department heads from across the nation are expected to attend.

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Call for Papers

1972 SUMMER SIMULATION CONFERENCE, June 13-16, San Diego, Calif.

Papers concerning recent advances in the mathematical modeling of systems and the development of new computer simulation methodologies are requested.

Basic topics include modeling of urban and industrial dynamics; physical sciences, and process design and control; and methodologies of simulation languages, numerical techniques, and graphics displays.

One page abstracts should be submitted to the program chairman as soon as possible.

For further information regarding topics and submission write: Dr. M.K. Horn, program chairman, Cities Service Oil Co., P.O. Box 50408, Tulsa, Okla. 74150.

ACM SYMPOSIUM OF THEORY OF COMPUTING, May, Denver, Colo.

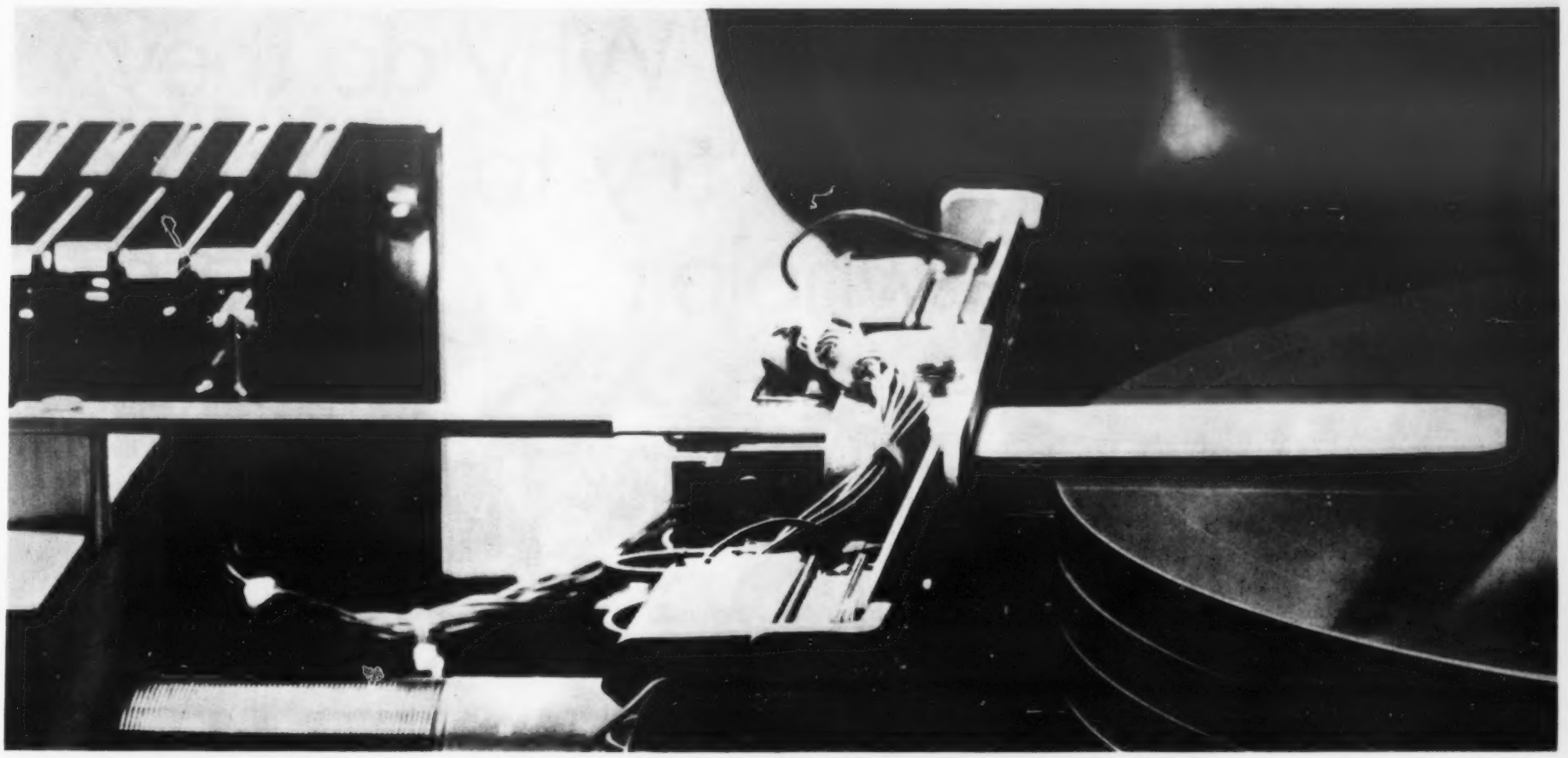
Papers are solicited describing original research in theory of computing including: automata and switching, formal languages, and computability and computational complexity.

Six copies of a 3-5 page abstract should be sent before Dec. 1 to Arnold L. Rosenberg, IBM T.J. Watson Research Center, P.O. Box 218, Yorktown Heights, N.Y. 10598.

SECOND U.S. COMPUTER SOLO EXHIBITION, June 8-13, Tokyo, Japan.

Papers for the IEEE technical program to be held in conjunction with the exhibition are requested. Topics include computer applications in transportation, medicine, business, education, process control, communications, design and engineering.

The deadline for abstracts, which should not exceed 500 words, is Dec. 31. Address correspondence to Prof. H.L. Garner, chairman, Tokyo Conference, Moore School of Electrical Engineering, University of Pennsylvania, Philadelphia, Pa. 19104.



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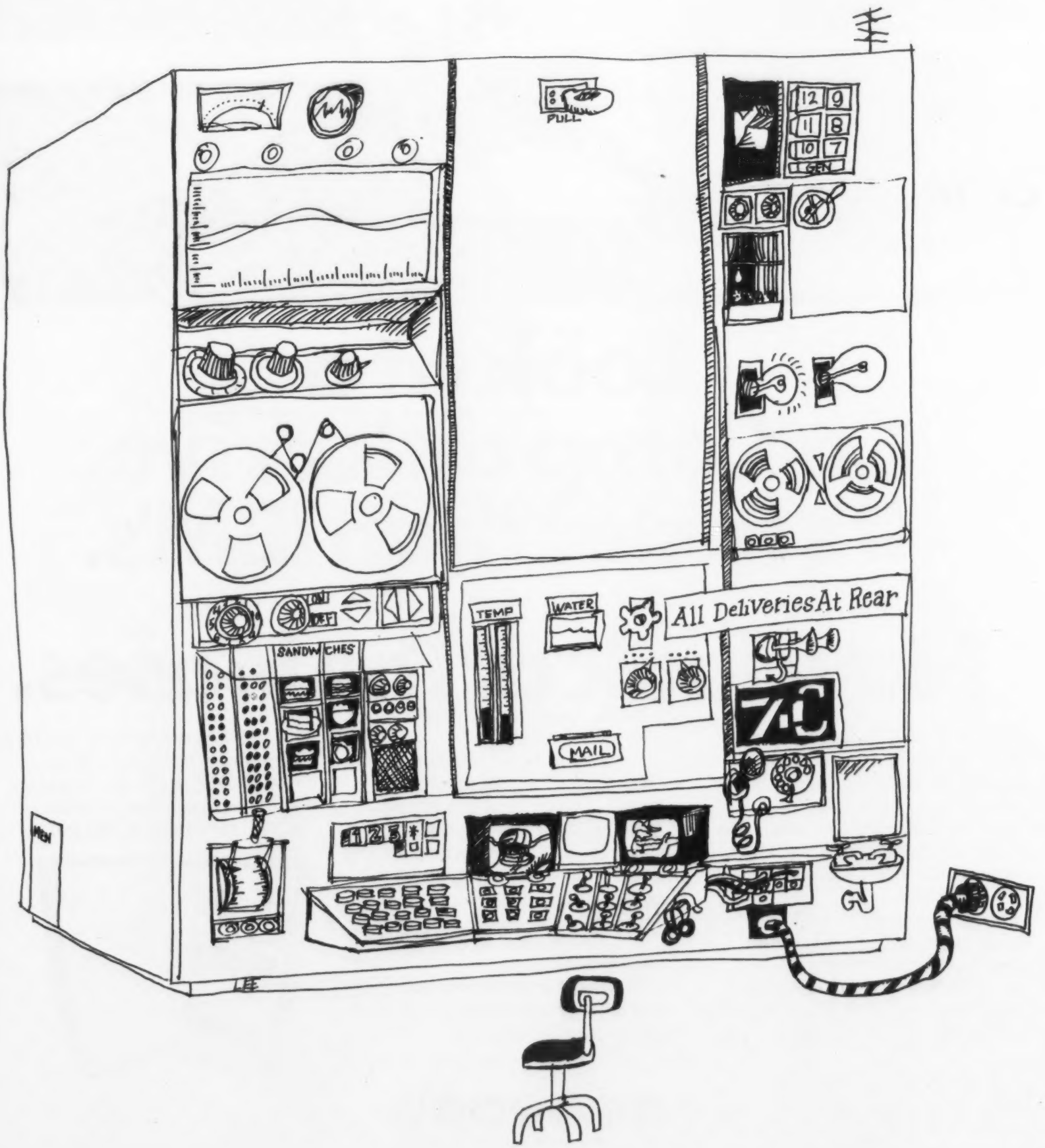

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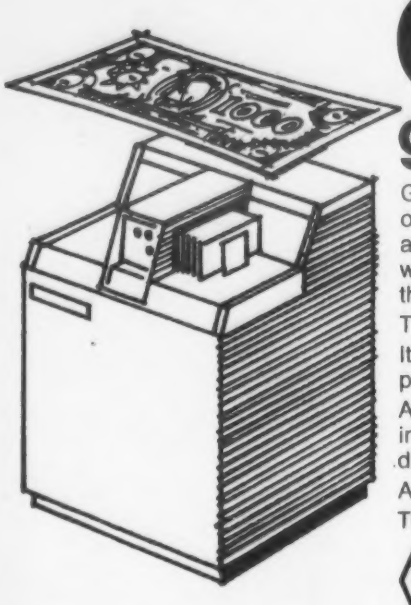

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New Zealand Commission To Study Privacy Laws

Special to Computerworld

WELLINGTON, New Zealand – The Law Revision Commission of New Zealand is examining the law relating to computerized "databanks" to ensure that personal information stored in them will not get into the wrong hands.

The Minister of Justice, Daniel Riddiford, said the commission agreed the part of the law relating to privacy most urgently needing attention was the collection and storage of personal information by computers.

The dangers stressed were that information concerning the lives of individuals would be accessible to those who had no reasonable need for it, that confidence would be impaired, that the process would be secret to the individual and that information obtained and used might be incorrect.

The commission consists of the Minister for Justice, members of the government and opposition parties, the heads of the three principal legal departments of state, lawyers, and professors.

The principal functions of the commission are to prepare programs for the reform of the law, to indicate the order in which particular topics should be examined, to allocate the work, and to exercise a general oversight of the law.

'Satellite' Computer in Coal Mine Will Streamline Payroll Control

FUKUOKA, Japan – "Satellite" computers installed at coal mine pit heads and linked by telephone lines to a main computer in the mine's head office, will go into operation next spring to speed up management control at the Mitsui Mining Company's Miike mining complex in Kyushu.

This sytem, the first to be adopted by a Japanese mining firm, will consist of two IBM 3/6s connected "on-line" to a 360/25 already in operation at the mine's head office.

Because of the complicated wage structure used in the Japanese mining industry, the preparation of the payroll for the 6,000 miners employed at the Miike mines is a slow and laborious process when done by hand. The "satellite" computers installed at the pit heads of the mines will speed up this operation.

In addition, the satellite computers will simplify manpower and resources control by enabling pit head managers to obtain quickly required information.

Updated Guide Set for Buyers

Special to Computerworld

SYDNEY, Australia – A combination of a computer and CRT photo-typesetting equipment has provided more up-to-date service guides for media buyers.

Aards, a media buyer's guide, was formerly produced once a year and updated by weekly amendment slips. This has now been replaced by new, completely updated books, known as Thomson's Media Data Service (TMDS), published every two months.

It is claimed that while Aards took 3,950 hours each year to produce, TMDS takes only 17 hours. Three companies were involved in the changeover: Thomson Publications, Idaps, a Sydney computer services group. and Computer Graphics Corp., (CGC).

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Minnesota Hospitals Share DP for Business, Lab Work

By Edward J. Bride
Of the CW Staff

ST. PAUL, Minn. – The country's largest non-profit computer sharing systems are operating here, according to officials of the Minnesota Hospital Computer Sharing System (HCSS), who said almost 12,000 beds utilize some form of the system.

There are actually two approaches to the sharing. Nineteen hospitals time-share 12 business applications, and five hospitals share a staff for automated laboratory systems.

Both systems were developed by working groups of Minnesota Blue Cross, which has a long history of cooperative data processing, starting with a payroll service in the early 1950s.

The business applications use Honeywell equipment: two H-4200s, one 2200, and a 1250, which is on-line with the 19 hospitals.

While the business computers comprise the largest time-sharing system "of its kind, in the world," one Blue Cross official claimed, the Automated Laboratory System (ALS) is the "first . . . of its kind."

ALS shares staff and, in some instances, hardware resources. Five hospitals have installed Clindata Systems made by Berkeley Scientific Laboratories.

The units are "on-line, real-time clinical laboratory data acquisition and processing systems," Blue Cross noted.

Required Gear Installed

The hardware is modular, so each hospital can install only those testing consoles it needs, and can send specimens to other participants for less frequent tests.

The participants are Abbott, Northwestern, and Mt. Sinai hospitals in Minneapolis, Mercy Hospital in Anoka, and St. John's here.

Clindata units are "on-line" in the sense that some tests are interfaced directly, such as automatic blood analyzers. Semi-automated blood cell counters have also been interfaced.

Small consoles specially designed for each section of the laboratory are used to enter manual test results. General purpose consoles are also used.

The lab system can also punch a paper tape with billing information in the format required by the Patient Accounting System, one of the 12 business applications.

The system's "real-time" capabilities come from monitoring automated and semi-automated instruments, accepting data from the consoles, and printing one or more of the 23 reports available.

Daily reports generated by the computer have reduced the clerical load of the laboratories by 30%, Blue Cross officials claimed. The reports can be generated at any time, except for a cumulative report at the end of the day.

Services at Cost

The computer services are provided at cost to the member hospitals, which control and operate all elements of the system while Blue Cross serves as an advisory and staff unit.

About 100 state hospitals are using most of the 12 business applications, although only the 19 are on-line. The real impact of DP, however, will be felt in the clinical or medical system, one official noted, since ALS is the "first of the shared systems that is directly related to patient care."

Blue Cross intends to conduct a study on savings next spring. The units were installed between last April and September, and "every indication" shows "some cost savings" which "realistically justify" installation of the systems, Blue Cross added.

Estimated Savings

Northwestern Hospital has estimated its savings at $1,000 per month in laboratory charges, plus a 50% reduction in punching paper tape as a result of that capability in the Clindata unit.

Northwestern is now doing the same volume of tests it did a year ago, but with five fewer technicians.

In the doctor's lounge at Abbott Hospital, a physician may request a CRT inquiry terminal to display, in sequence, all daily reports on his patients.

A speed control enables the physician to vary the rate at which the lines of test results move on the screen.

Abnormal results can be continuously displayed until the doctor wishes to move on to the next patient.

At Mercy Hospital, test requisitions are in the form of machine-readable mark sense cards which are read into the system by an optical card reader.

A Standard Register punch device allows punching of the patient ID, and the tests requested are mark-sensed by the nurses.

Mercy also has an ACS35 Teletype in the business office, for the Patient Accounting application in the T/S system. This unit is connected in their ALS, and admissions and discharges to ALS are being done from the business office.

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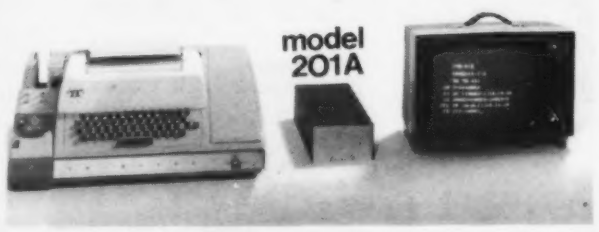

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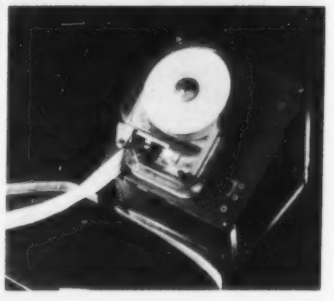

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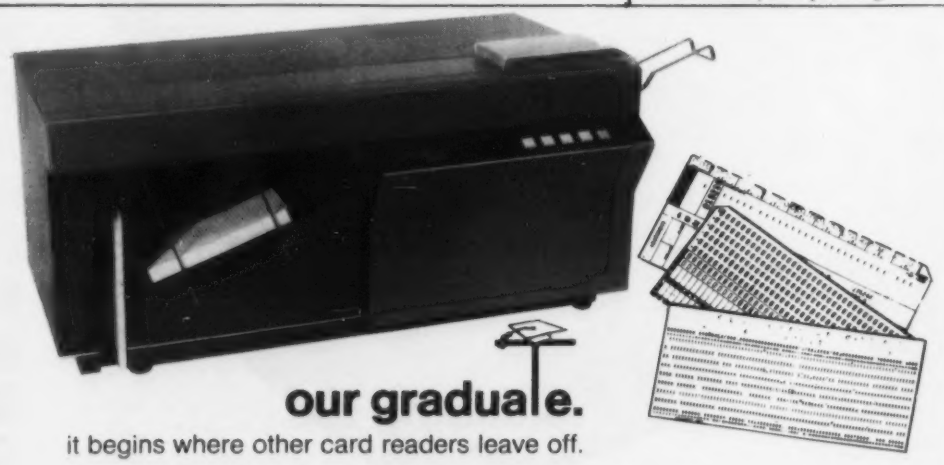

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Large Tape User Stores More in Library, Cuts Retrieval Time With Special Units

PISCATAWAY, N.J. – As data processing operations at American Telephone and Telegraph's facility grew, a space and time bottleneck caused by tape storage became an increasing problem.

Clerks lost much time walking up and down long aisles of conventional 7-tier open-faced racks to obtain a single reel. Expansion of the library containing 30,000 reels stored in 214 of these units would have been necessary to accommodate more tapes.

More Tapes, Less Space

After an intensive investigation, management decided electronic Conserv-a-trieve units made by Supreme Equipment Systems Corp. would solve the tape storage problem. The study indicated the storage units would permit AT&T to store 58,500, 7/8-in. tape seals in less floor space than it took to house 30,000 reels in conventional open faced racks.

Part of this increased capacity was because the units can be custom-built, utilizing all available floor and/or air space.

Electronically controlled units deliver tape reel containers from anywhere in the system to clerks seated at central work stations. This permits the modules to utilize air space that would have been lost to conventional racks because of the raised floor of the computer room.

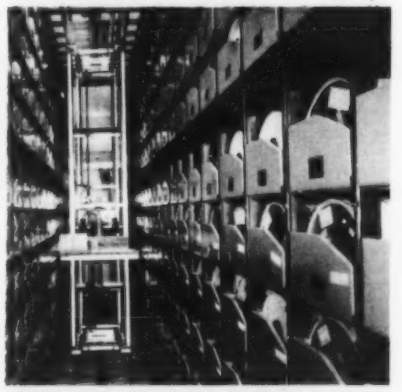
Instead of resting on the computer room floor, the Conserv-a-trieve units rest on the concrete floor of the building and rise 13 tiers high to the room's drop ceiling and extend 25 columns long.

Despite the fact three tiers are below the computer room floor, clerks are given immediate access to the material stored there because the conveyors bring a container from anywhere in the system to their work stations in seconds.

Fast Retrieval, Storage

Each of the storage units consists of two facing banks of electro-optically coded shelves on which metal tape containers are stored. Upon an electronic signal from a control console located at the front of each unit, a conveyor, riding on a track between the facing shelves, positions itself at any height anywhere along the entire length of the installation.

Once the desired container is located, it



Electronically controlled conveyor withdraws desired tape container from Conserv-a-trieve unit at AT&T and delivers it to work station aperture in seconds.

is drawn onto the conveyor by a nonmagnetic mechanical latch device and speedily delivered to the work station aperture.

After completing work on a delivered container, the clerk at the keyboard console presses a restore button and the container is automatically returned to its proper storage position.

The complete cycle from entry of the request code to the return of the container to its storage location is achieved in a matter of seconds.

Sequential Filing Problems

Under the old storage system, the sequential filing system followed by AT&T in this installation caused problems. Each tape of new data had to be assigned the next number in sequence and then filed in the conventional racks accordingly. This often means the back room in a top tier.

If the data required constant referrals, clerks were forced to trek to the ends of the file room with time-consuming costly frequency.

Now, data requiring frequent referral is stored in modules close to the work station for fastest retrieval.

Access to the totally enclosed tape storage units can only be gained through a security locked service entrance at the rear of the system or through the console area. At the console, the delivery aperture panel as well as the control keyboard are both locked by keys to prevent unauthorized access to the contents of the system.

Besides finding space for a number of additional desk work stations, so much floor space has been saved in the 42 ft by 48 ft area that AT&T plans to bring its disk files into this system.

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Fewer Miles, Lower Costs

Programmed Delivery Service Means Fresh Groceries

By Robert Tannehill
Special to Computerworld

BELLE VERNON, Pa. – Fox Grocery Co., one of the country's oldest and largest wholesale distributors, uses its computer to match vehicles, customers and freight in a massive daily delivery job.

Fox Grocery's Belle Vernon Division is by far the largest of its three warehousing facilities. It delivers some 8,000 items to 180 retail customers (including 90 of its own franchised Foodland supermarkets) in a four-state service area. Some 60 truckloads a day move out of the Belle Vernon warehouse.

To manage the job, Fox has been using IBM's Vehicle Scheduling Program (VSP) since early this year. The system has produced a number of benefits. For example:

- Seven to ten fewer drivers over an average week, even with 15% heavier delivery workload
- Total mileage driven down 5%
- Overall transportation costs down
- Customers enjoy better service – on-time deliveries of fuller loads, and "family grouping" of deliveries on pallets or carts.

VSP requires about 10 minutes of computer time on the company's IBM 360/40 to produce the daily schedule, including preparation of the key route listing and summary documents, a fleet utilization report, and dispatch data.

"The aim of the vehicle scheduling program, in a nutshell, is to get fully loaded vehicles to designated delivery points in the least amount of travel time," says Ed Kearns, Fox transportation manager. "We attempt to minimize mileage, too, but customer service is more important, so the computer selects the fastest route, regardless of mileage."

To handle this scheduling assignment, the computer program requires considerable prior information on the fleet vehicles, the delivery points, distances and speeds, customer facilities and delivery restrictions, order quantities and due dates.

Two Separate Programs

The system actually consists of two separate, though interrelated, programs: Network Analysis, which considers all points in the delivery network, then calculates the shortest travel time between any point and any other point; and Schedule Production, which uses the output of network analysis, plus current order and fleet data, to set up routes and specify vehicles to be used, stop sequence and quantities to be delivered.

To set up the network analysis, Fox transportation officials used a large map to plot all existing store accounts, plus all potential accounts. All major highway exits were plotted and the mileage between exits recorded. Miles per hour were calculated for each geographical area, then the workable routes from the major exits to a given delivery point were measured by the drivers for time and distance.

All of this data, involving 227 zones and 372 links, was input to reflect true distance and travel time between every point in the network. From this information, the program calculated the minimum distance and travel time from any point to any other point, and these calculations were put on a disk file for use in the daily scheduling routine.

Specific Delivery Date

Another master data file that comes into play gives specific delivery information relating to every delivery point in the network – the customer name, zone identity number, type of vehicle best suited for deliveries to that store (based on receiving dock, unloading facilities and crew availabilities), and earliest and latest time of day for accepting deliveries.

Also on this record is a production code showing the number of pieces of merchandise that can be unloaded per hour at the store (based on actual time study), and a percentage code that indicates the mix of cart-type and pallet-type loads delivered to the store. This customer data master file is also relatively stable, and is re-run only when a new store location is added to the network, or there is a change in store unloading facilities or delivery restrictions.

Dovetails With Order Entry

The day to day schedule production dovetails neatly with Fox Grocery's computer-based order entry and pre-bill procedure. The system breaks the order down to workable shipping units within vehicle capacity.

As a by-product of the order processing routine, a punched card is produced for each order and this becomes input to the vehicle scheduling run. It provides all the current order information the program needs – customer and store zone identity, weight, volume, pieces and overflow. Minimum distance and travel time information is available from the network analysis file, and delivery point restriction data is available from the customer master file.

During the schedule production, which is run each day for the next day's deliveries, the program also considers current vehicle and driver availabilities, both of which are subject to daily change; maximum number of stops allowed per route; and the maximum driver working time per day.

Additional Time Allotment

As a final refinement, there is a fixed additional time allotment for each stop on a route to compensate for any delay the driver might encounter in getting delivery papers signed, checking manifests, and the like. A further adjustment in route timing can be made in the event of severe weather conditions.

The computer completes, in about 10 minutes, the scheduling for a daily average of 60 truck loads destined for 70 different store destinations.

The route listing output shows route, vehicle, customer, stop sequence and time, weight, and volume.

Supplementing the route list is a daily fleet utilization summary of all pertinent factors.

Finally, a third key output is the dispatch sheet, which lists each route vehicle assigned in departure time sequence.

R. Tannehill is general manager, Belle Vernon Division, Fox Grocery.

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COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Teleprinter Issues 'Alerts'

Philly's Air Pollution Monitored

PHILADELPHIA – Visitors to the nation's Bicentennial celebration here can expect to be breathing "the cleanest air of any major metropolitan area," according to city officials.

To help achieve that goal by 1976, the city is operating a computer-controlled air pollution monitoring system. Six of 10 planned automatic sensing stations are now "on-line."

"The aerometric network of monitoring stations connected to a computer, which instantaneously gathers the data as the sampling instruments measure the air, will be an invaluable tool in the city's fight against air pollution," said Edward F. Wilson, assistant health commissioner for Air Management Services.

Computer reports are designed to:

- Predict and issue early warnings of dangerous air pollution conditons hours, and eventually days, before pollutants reach harmful levels
- Detect sources of air pollution in a fraction of the time previously taken, days, instead of weeks or months
- Provide better identification of pollution sources so that inspectors can gather additional evidence for legal action.

The computer, an IBM 1800 data acquisition and control system, will automatically analyze 4,200 measurement/hr to generate detailed air pollution status reports for the city every hour or by request as needed, Wilson said.

The six new automatic air monitoring stations built by Leeds & Northrup Co. measure sulphur dioxide, particulate matter, carbon monoxide, wind speed and direction, and temperature.

Air management officials are advised by a teleprinter when air pollution conditions are in "alert," "warning," or "emergency" status.

"With this system, we expect that, by being forewarned through constant monitoring and taking quick action in the early stages, we won't have to take the drastic measures that would be required by emergency conditions," Wilson noted.

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Two Computers Share High-Speed Printer/Plotter

RICHLAND, Wash. – At Battelle-Northwest, research scientists and engineers get rapid printouts of alphanumerics and graphics data from two computer systems using a single high-speed electrostatic printer/plotter. Quality of these printouts is adequate for use as artwork reprinted for customer reports.

One Battelle contract is operation of the Pacific Northwest Laboratory (formerly Hanford Laboratory) for the U.S. Atomic Energy Commission. This calls for original work in several complex fields – such as nuclear phenomena, reactor design and safety, radiation effects and tolerances, and the effects of thermal effluents on aquatic life.

To aid in these studies, Battelle uses two computers interfaced to a Gould 4800 printer. A hybrid (analog/digital) computer system includes an Ease 2123 analog computer interfaced to a PDP 7 digital unit and used for nonlinear function analysis and simulation. A digital system consisting of an SEL 840A with 24-bit, 16K core and a 1-million word disk is used for batch processing, information system, and research program development.

The 4800 has the speed and capacity to serve both computer systems on a multiplex basis. This is an unusual capability for a peripheral unit of this type but, according to Paul Dionne, technical leader of process analysis and simulation, it was the 4800's ability to print out both alphanumerics and graphics – separately or intermixed – that was most responsible for its purchase.

An interesting simulation program at Battelle-Northwest illustrates the utilization of the printer/plotter for complex graphics.

The program involves the study of tracer dye movement and thermal patterns in bodies of water. It is being applied to evaluate condenser outflows from existing power plants and to predict the possible impact of proposed sites.

Data collected by advanced aerial imaging systems are recorded on magnetic tape in the aircraft and subsequently evaluated on Battelle-Northwest's hybrid computer system. Hard copy output can be presented as isoconcentration or isothermal plots on the 4800.

Through special techniques, stereoscopic pairs of thermal contour plots can be produced for three-dimensional viewing and determination of higher and lower energy levels.

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New Literature

A brochure describing Systemation's Basic Systems Course for Programmers is now available from Systemation, Inc., Box 730, Colorado Springs, Colo. 80901.

The Interdata Model 70 minicomputer is described in a bulletin available from the company at 2 Crescent Place, Oceanport, N.J. 07757.

Time Brokers, Inc. is offering a booklet *"The TBI Guide to Computer Sub-Leases – A Self Teaching Study."* Write: Time Brokers, Inc., 500 Executive Blvd., Elmsford, N.Y. 10523.

Orbit/1, an OCR system from Orbital Systems, Inc., is the subject of a brochure available from the company at Church and Fellowship Roads, Moorestown, N.J. 08057.

Paradyne Corp. has released a brochure describing the PIX-600 Parallel Interface Extender. Contact: Paradyne Corp., 2040 Calumet St., Clearwater, Fla. 33515.

Brochures describing Concord Control Inc.'s Graphic Data Processor and MK 8 and MK 10 plotter systems are available from the firm at 1282 Soldiers Field Road, Boston, Mass. 02135.

A bulletin from Beckman Instruments, Inc., describes the Model 1454 Digital Printer. For a copy of Bulletin 5004, write Technical Information Section, Electronic Instruments Division, Beckman Instruments, Inc., 3900 River Road, Schiller Park, Ill. 60176.

Eastman Kodak has published a booklet detailing microfilm systems for charge card applications. Copies are available from Dept. DP-1034, Business Systems Markets Division, 343 State St., Rochester, N.Y. 14650.

A space mission analysis system, Space/360, from Space Applications Corp. is the subject of a bulletin available from the company at 999 N. Sepulveda Blvd., El Segundo, Calif. 90245.

A brochure from Ferroxcube Corp. details their Mark 6000 Main Memory Expansion System for the IBM/360. Write: Ferroxcube Corp., P.O. Box 359, Saugerties, N.Y. 12477.

Adar Associates, Inc., has published a data sheet describing its SQ 260/280 Data Generator. Write the firm at 85 Bolton St., Cambridge, Mass. 02140.

The Micro 1600/21 minicomputer is the subject of a bulletin available from MicroData Corp., 644 E. Young St., Santa Ana, Calif. 92705.

Description and specifications of the Ampex Terabit memory system are contained in brochure G414, available from Ampex Corp., Tom Williams, Mail Stop 7-13, 401 Broadway, Redwood City, Calif. 94063.

A fact sheet on the Model 8063 80-column card reader, compatible with System/3s is available from Bridge Data Products, 738 S. 42nd St., Philadelphia, Pa. 19104.

Potter's line of high performance disk storage drive systems are described in the brochure, *Direct Access Storage Systems,* now available from Potter Instrument Co., Inc., 532 Broad Hollow Road, Melville, N.Y. 11746.

A brochure devoted to the Fastrack disk storage line of Pacific Micronetics, Inc., is available from the firm at 5037 Ruffner St., San Diego, Calif. 92111.

A new Time Code Generator module is the subject of bulletin CG526 from The A.W. Haydon Co., 232 N. Elm St., Waterbury, Conn., 06720.

Specifications and data on the new ISI 105mm Microfiche camera is available from Image Systems, Dept. C700, 11244 Plaza Court, Culver City, Calif. 90230.

Bulletin #7101, "Applications of the Un-Computer to Process Control Systems," describes Ferroxcube's series FDC-300 programmable digital data controllers and their capabilities. Write: Ferroxcube Corp., Saugerties, N.Y. 12477.

A 25-page microprogramming Implementation Guide is available from Datapac Inc., 18872 Redhill Ave., Santa Ana, Calif. 92707

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Speed: Input data is transmitted in either half or full duplex mode. Data can be retrieved from an external memory or transmitter at rates from 110 to 2400 baud.

Interface: Standard RS-232-C, TTL, or 20 ma current loop.

Applications: The basic function of Teleray is to enter and readout the data from a computer memory. It is readily adaptable to either single or multiple display applications, such as computerized teaching, keypunch replacement, inventory control and readout, hotel and ticket reservations, insurance information, price quotations and many others.

For information, write or call collect James R. Anderson at

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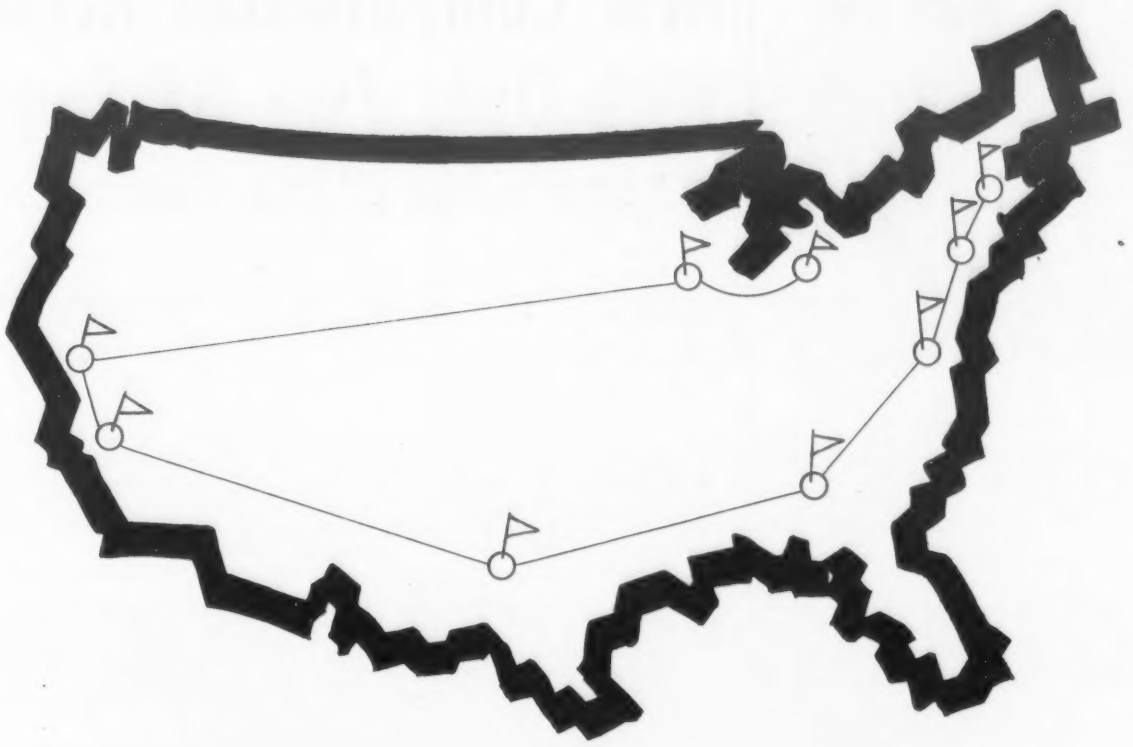

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Special to Computerworld

WEST FRANKLIN, N.H. – Harry S. Cook of Acme Staple Co. is striving to meet a real challenge – one-week turnaround on every order coming into the plant. This is no simple objective. As the world's oldest manufacturer of industrial staples and stapling machines, Acme produces 1,200 different types and sizes of staples for use with customized models of 100 basic machines.

These products are marketed and leased through dealers and distributors in 50 states and throughout the world.

Acme has 3,200 active parts in its inventory and a like number of inactive parts.

Payroll, accounts receivable and payable, general ledger and inventory, invoicing order writing and other functions are processed through Acme's IBM 3/10.

As a result, Acme has been able to automate its accounting functions with only two full-time data processing employees. Harry Cook spends less than half of his time in the computer area, and a receptionist helps out by devoting part of her day to the task of punching and verifying cards.

Cook makes it sound easy – he has put a dozen accounting functions on the 3/10 himself. Writing programs takes him from 20 minutes for a simple program to a day for more intricate functions. But, he admits the first program he wrote, automating the monthly statements, took four days.

"I needed experience with RPG II and with the computer before I could get the programming down pat," said Cook, who has an industrial and mechanical engineering background and doubles as plant engineer, design engineer and purchasing agent, as well as programmer and data processing manager.

"Basically, programming isn't that difficult," he said, "though it scares a lot of people. For example, accounts receivable, invoicing, back orders pricing and order writing are really just one operation from a programming standpoint."

Cook admits that he had a head start – Acme previously used an IBM 403 accounting machine, which is programmed with hand-wired board panels, instead of cards.

"Cards are a lot easier to program than board panels," he said, and added: "Do you know of anybody who needs some 403 panels?"

Straight Card Conversion

Cook converted most of 44,000 cards from the 403 machine to 3/10 in one evening. He made a straight conversion from the 80-column cards, instead of adapting the available information to 96-column cards.

"I prefer the 3/10 format for several reasons," Cook said. "It gives you printed cards, whereas you couldn't read the cards on the 403. Also, it gives us summary reports and provides a facility for acknowledgements, invoices and payroll.

Daily Summary

"And for the first time, we have an automated inventory control system. Each order is acknowledged the day it is received. The acknowledgement card becomes input for inventory, and available inventory

(Cont. on Next Page)

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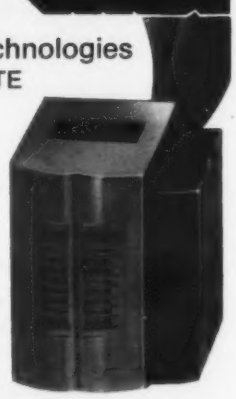

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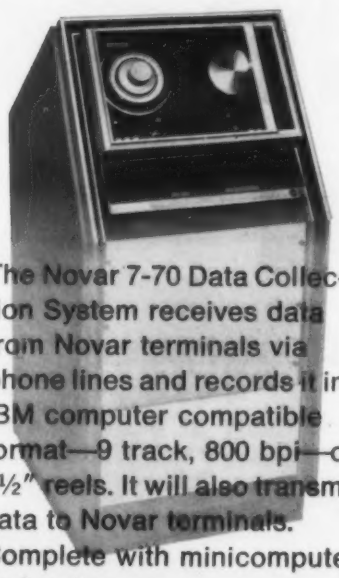

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Data Bank for Adoptable Babies Proposed

Special to Computerworld

WASHINGTON, D.C. – A data bank with a heart – that's the proposal of one U.S. Senator.

A computerized National Adoption Information Exchange Program is being proposed to alleviate current difficulties in placing adoptive children across state lines.

The proposal takes the form of an amendment, proposed by Senator Robert P. Griffin (R-Mich.) to the Omnibus Social Security and Welfare Reform Bill.

Under the amendment, the Secretary of Health, Education and Welfare would be authorized to establish the computerized information exchange. One million dollars would be the funding for the first fiscal year.

A data bank of children awaiting adoption, and parents wishing to adopt, would be maintained. The data would be accessible both nationally, and cooperatively with any foreign countries having similar programs.

Cross-state adoptions currently are difficult-to-impossible to make, due in part to the multiplicity of state agency procedures. The proposed bill could cut through that problem, reduce the burden to the taxpayer caused by state support of unplaced children and introduce an element of human warmth into the often cold computerized data bank arena.

How Safe Is Your Installation?

Special to Computerworld

OAKLAND, Calif. – "How vulnerable is my installation?" To answer that question Security Services, International, now offers a computer security audit. SSI performs this service and provides a report of its findings based upon an on-site study of all aspects of an installation, including operating requirements and practices, data flows, hardware, and organization factors.

The audit report evaluates risks and recommends improvements. A unique feature of SSI's audit is a Risk Matrix which gives a quantitative evaluation of risks and exposures.

Security Services is headed by Philip H. Reagan at Suite 17, 600 16th St., 94612.

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Firm Easily Automates Accounting Functions

(Continued from Preceding Page)

equals actual plus on-order amounts."

As new orders are received, inventory levels are automatically adjusted by the computer. The inventory cards become input for production control, and the computer compares available levels with minimum and maximum levels and zero.

If the level exceeds maximum, the computer produces an exception message. If it is below the minimum level, it prints a warning message for production control.

Cook produces a daily summary report of on-order items, broken down by item, whether it is on-order or not billed, etc., so that Acme management can determine on any given business day the value of work in process.

Likewise, the accounts receivable system is automated so that management can monitor orders by customer category – consumer, jobber, distributor, dealer – and by statement period, whether payment is current, or 30, 60, 90 or 120 days overdue. Cash receipts are automatically charged against the oldest balance. Staple production is reported daily – by each of 1,200 items and quantity.

Additionally, the small computer is used to determine a cost factor for each of the 1,200 staples which Acme manufactures – using 28 different criteria, such as length, type and cost of wire used, packaging, etc.

Further, a computer-produced job cost report is based on work cards that manufacturing employees in the plant punch each time they start and complete a new job.

Three-fourths of all orders can now be handled without rerunning the customer's names and addresses, which are stored in the computer's memory. Previously, they had to be punched each time a new order was received. A minimum billing feature in the computer's memory limits billing to a minimum of $2.50. C.O.D. billings are automatically marked with asterisks to eliminate confusion.

A new report provides Acme management with an accounts payable trial balance which presents an up-to-date picture of all payables. A summary card for each payables account permits the 3/10 to produce vendor checks automatically, based on invoices, total discounts and vendor names and numbers.

A similar summary card for each receivable account updates the account balance daily, and includes the account number, amount receivable and bank check number for payables.

"The beauty of the computer is the way it has cut deeply into our paperwork handling volumes," Cook said.

Fascinating things are happening up in Schwedock's room.

Harry's in Las Vegas at the Dunes Hotel demonstrating our PortaCom traveling data terminal. The one that goes anywhere, packed in a lightweight attache case. With a built-in acoustic coupler, so you can use any telephone to contact your computer on PortaCom's alphanumeric keyboard.

And get answers on a full-page, letter-size printout, with up to three carbons.

What Harry's really showing off is our new magnetic tape cassette option, which increases transmission rates from 10 cps to 30 cps. Stores over 50,000 characters on a single cassette, and can record or playback from remote locations. For data rate buffering, data collection, or program preparation.

Come up to Harry's suite at the Dunes. That's the only place he'll be and the only place you'll be able to see the remarkable PortaCom and new tape cassette.

If you call Harry at the Dunes and the line's busy, it's probably PortaCom talking.

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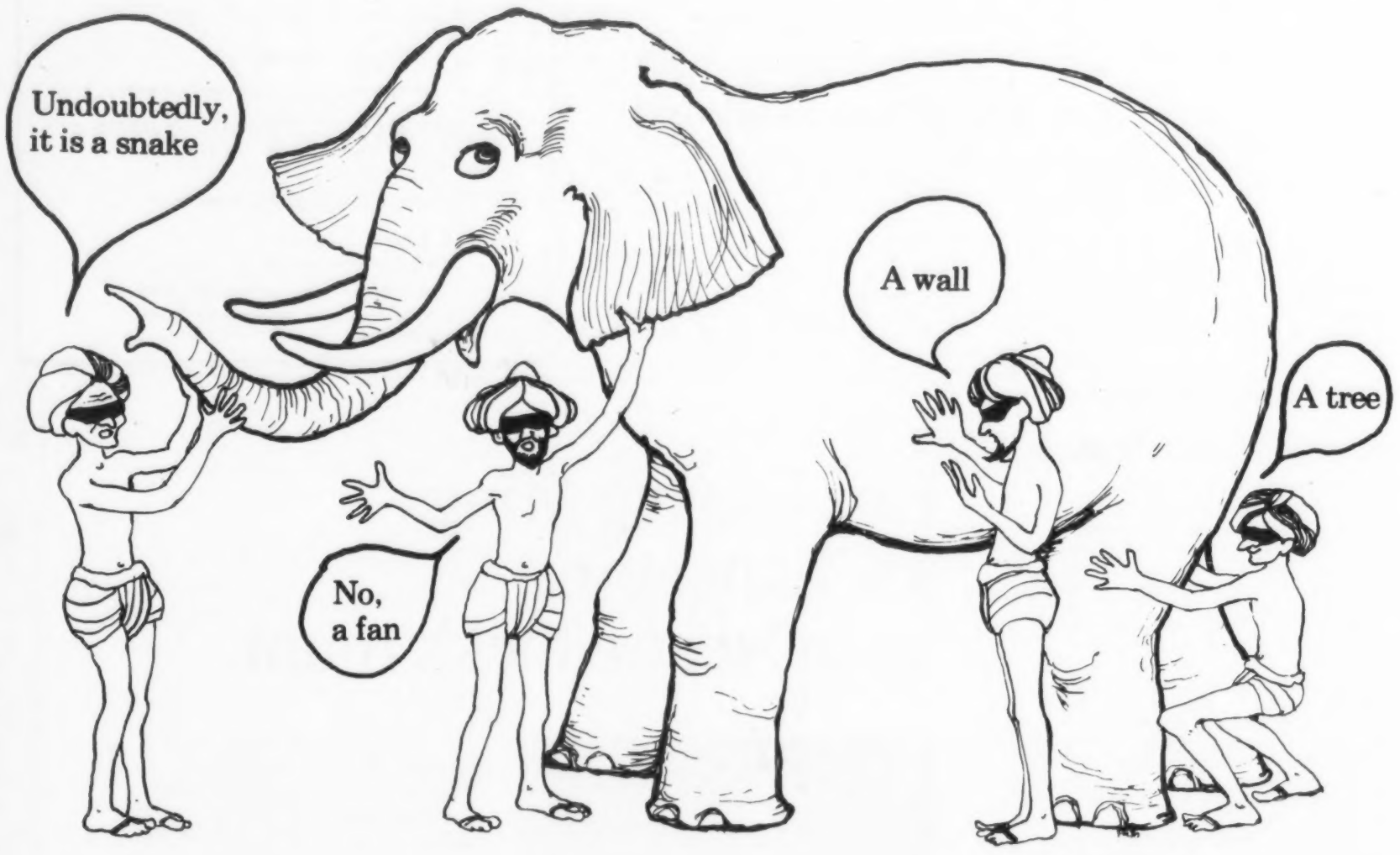

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Like most executives, you probably get your business information in bits and pieces. It comes in many forms; arrives at different times. Your desk gets cluttered with industry journals, newsletters, reports, and newspapers. There never seems to be enough time to read any but the few best. Because your information arrives at different times, it is also difficult to analyze developments or relate news items you read about in a journal one day to a newspaper report you see ten days later.

During the past year, thousands of executives, at all levels, have found a new way to really keep up with industry developments. As a result, they now *read far less* and yet *know much more* about their business. They spend less money on subscriptions and get more complete coverage. They spend less time reviewing developments and more time planning solutions.

They are subscribers to Computa-Data, a personalized business information service which is totally *unlike* any subscription you have ever had. Here's how it works. You tell us, in advance, the business subjects that are relevant to you. Each month, your "interest profile" will be exposed to a computerized file containing thousands of digests of new articles published during the past thirty days in over 1600 business publications and other sources, world-wide. (We also translate over 80 foreign language publications each month.) Our unique computer system will then select for you every article that is relevant to your "interest profile" and will print out detailed digests of these articles in one 8½ x 11 report, completely indexed, cross referenced, and source-documented. Each month your Report is then rushed to you by first class mail. In effect, you will have your own, personal trade journal, made up exclusively for you, to your specifications. You may even change your "interest profile" as often as you like, at no extra cost.

For the first time, with the combination of Computerworld and Computa-Data you will really be "up" on all the news in your industry. You will not have to worry about whether you have missed anything important. Your knowledge of your business will no longer be limited by the number of trade journals you can review, or the number of languages you understand. Often, you will read digests from valuable publications and sources which you were not even aware existed.

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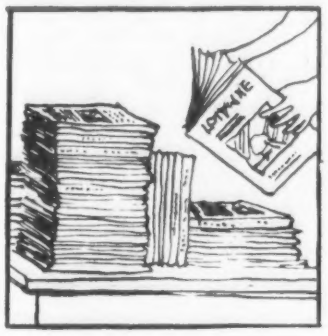
Computa-Data is published by Computerworld in cooperation with International Systems Design, Inc. And who else but the publisher of the industry's top business publication could be capable of providing you with the ultimate business information service?

Many subscribers to Computa-Data tell us that it is action generating. Computa-Data makes things happen . . . memoes are written, meetings are called, new plans made, old plans modified. They especially value having all the data they need between the covers of one report, for fast reading now and easy reference months later.

Join the informed executives at IBM, Honeywell, Arthur D. Little, Univac, National Cash Register, RCA, Memorex, Xerox, who are among the many firms subscribing to Computa-Data. Try three issues for just $8.33 a month. We'll fully refund your investment if you are not entirely satisfied. Details are on the opposite page.

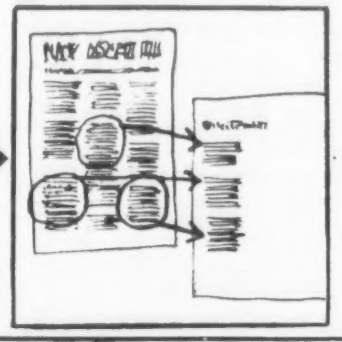
Flow chart of how your monthly Personalized Report is published

Over 1600 separate publications and other sources are reviewed each month including foreign language publications.

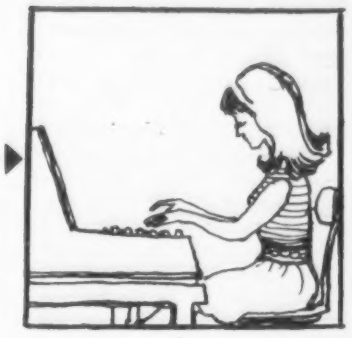


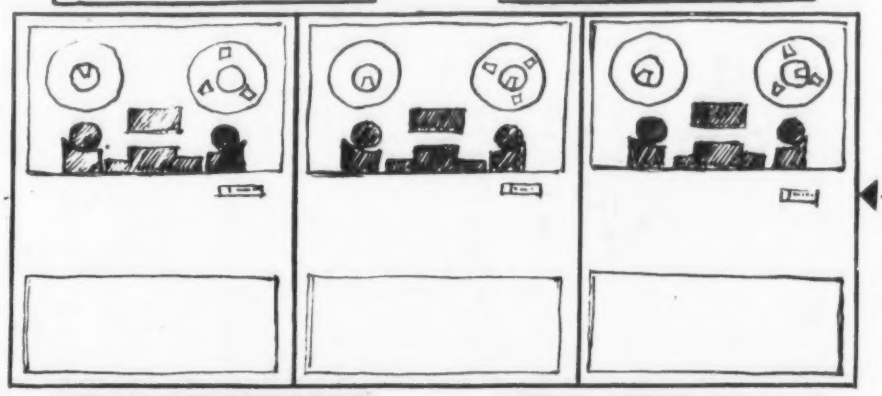
Each source is carefully reviewed and analyzed by skilled industry specialists and every relevant article selected for digesting.

Each article is accurately digested to include all the facts in the original, less any excess verbiage.



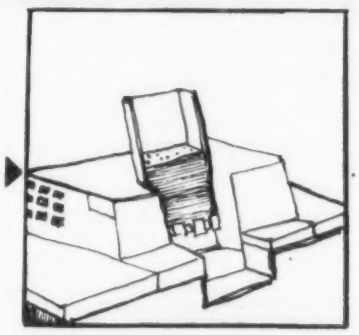
About 6,000 digests per month are then entered into our computer system.



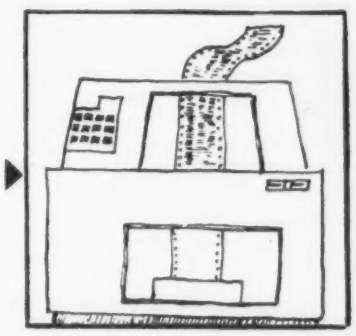


When your order is received...

...Your selected subjects are then keypunched to comprise your "interest profile."



Each month, your "interest profile" cards are then exposed to the new month's file of 6,000 abstracts. A unique computer system then examines every article for relevance to your interests.



The computer selects every article among the 6,000 that are 100% relevant to your interests and prints out the digests on 8½ x 11 paper. Report is collated, bound and rushed to you by first class mail.

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2 Analysis Factors

- ☐ Abuses
- ☐ Applications
- ☐ Contracts
- ☐ Costs
- ☐ Education
- ☐ Foreign Trade
- ☐ Installations
- ☐ Languages
- ☐ Leasing
- ☐ Legislation
- ☐ Licensing
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- ☐ Malfunctions
- ☐ People
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- ☐ Regulations
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- ☐ New Services
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BROOKINGS, S.D. – Any pheasant hunter knows the big birds move pretty quickly – both on the ground and in the air. But here, where wildlife is a product of the land and the state's economy depends partly on its proper management, knowing that is not enough.

A research team at South Dakota State University is using a computer to plot the movement of birds equipped with small radio transmitters that reveal the pheasant's location at specific times of the day.

"The pheasant is polygamous," said Dr. Donald Progulske, head of the Department of Wildlife and Fisheries Sciences, who is directing the study. "The rooster sets up a crowing territory and gathers a harem of hens.

"But we don't know how big either his territory or his harem is. We'd like to find out where the hens nest and where the broods go after hatching.

"We already have some answers. The birds use a suitable area such as an alfalfa field for roosting and nesting. When the cover is harvested, the birds move, but stay within the territory. In the winter they shift to shelterbelts or heavier cover, but remain within a 100-acre range. We've also found the hens don't necessarily mate with the nearest rooster, which may be one of several factors that help determine 'home' territory for a specific bird."

Pheasants within the one-square mile intensive study area are caught at night by workers using bright spot lights and long-handled nets. Captured birds are then fitted with a small radio transmitter which broadcasts a signal at a particular frequency in the range of 150- to 151 MHz. The radio and harness do not harm the bird or hamper his normal activity.

A central receiving tower picks up signals from the radio transmitter and, by using a directional compass which "homes in" on the signal, a coordinate location for the bird is obtained.

At the same time, a mobile receiving unit, located at one of 20 predetermined sites surrounding the central tower, takes a similar reading. Once the two compass readings from separate points have been determined, simple triangulation is used to pinpoint the location of the bird at a given time.

Readings are taken on each bird every three to four hours. Every two weeks the data is entered into a 360/40 at the South Dakota State Computing Center. The computer processes the information and provides input to an X-Y plotter, which traces the birds' movements over the two-week period.

"The computer provides us with the radius of activity for each of the seven or eight birds being studied at any one time," said Dr. Progulske. "We also get some additional 'sight observations' of birds which are equipped only with identifying back tags."

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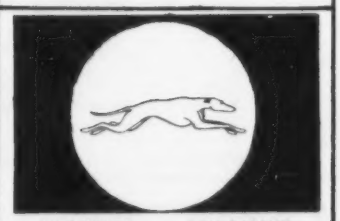

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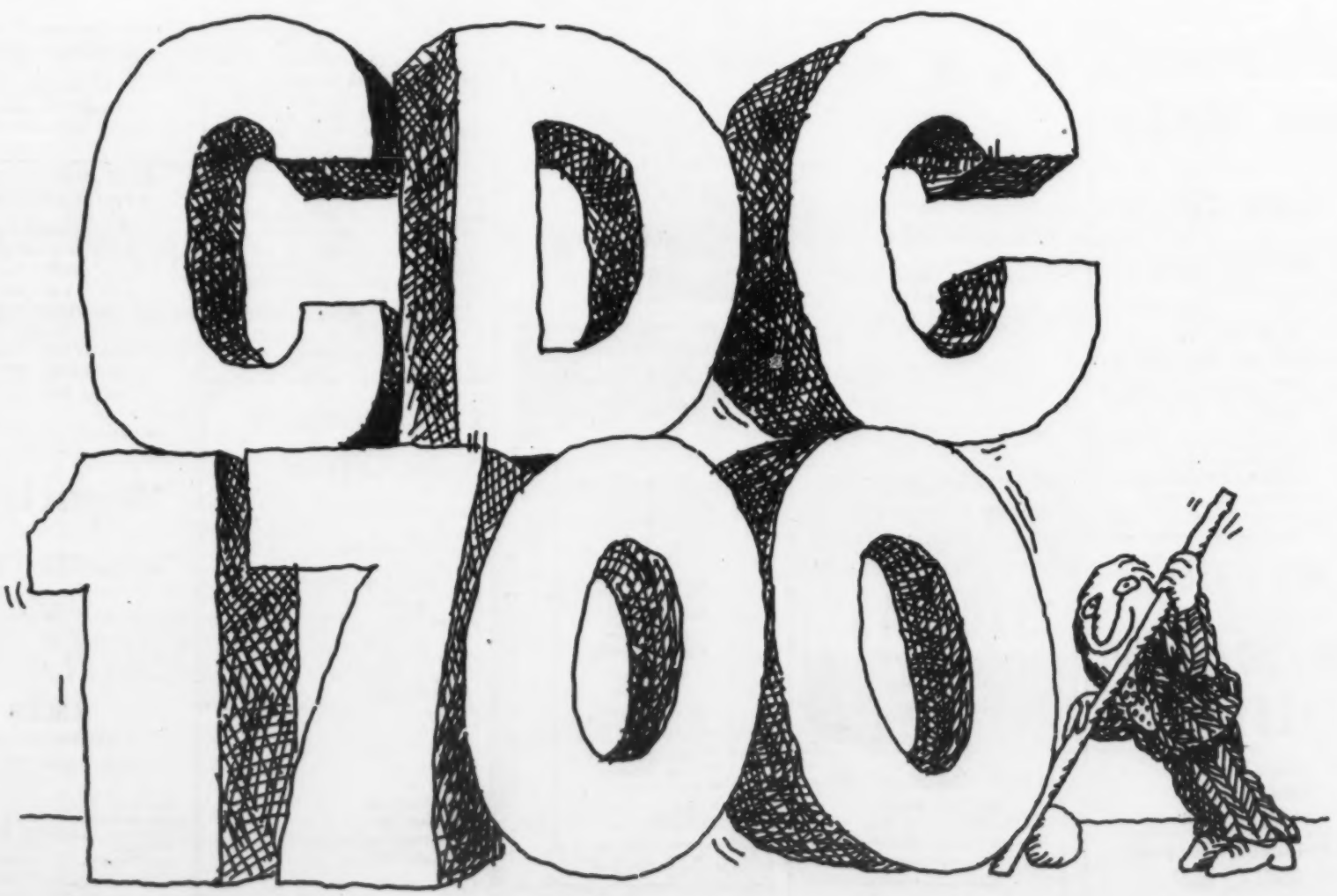


computer industry

a Computerworld news section about the nation's fastest growing industry

November 17, 1971

CI Notes

Mohawk to Get Marshall

SAN MARINO, Calif. – Marshall Data Systems will be acquired by Mohawk Data Science Corp. if an agreement in principle is approved.

Recently the division of Marshall Industries and DPF broke off talks that would have led to a merger of the two. Marshall is suing DPF over the break up of the merger discussions.

UAL Enters DP Arena

CHICAGO – Another large commercial firm has entered the DP business to defray its own internal data processing costs and turn its DP center into a profit producer – a move that represents an ever increasing trend.

United Air Lines has formed a Computer and Communications Division to serve both the airline and to sell services to others – primarily other airlines. The airline currently operates computer centers in San Francisco and Denver as well as here.

Not All on the Floor

LAS VEGAS – Not all of the new product action at the Fall Joint Computer Conference here this week will be on the floor.

For example, System Development Corp. is expected to introduce its programmable terminal in a press briefing in a hotel suite and Data Products Corp. will be showing a new magnetic tape cassette option for its Protacom terminal at another suite.

UCC Enters Used Market

ARLINGTON, Va. – University Computing Co. has entered the used computer market with the establishment of University Computer Exchange here under the direction of E. Lee Meadows.

The new unit will have offices in New York, Boston, Los Angeles, Atlanta, Chicago, and Houston before the end of 1972, the firm said.

Supershorts

Thomas J. Watson Jr., chairman of the executive committee of the Board of Directors at IBM has been selected to receive the 1972 Electronic Industries Association's Medal of Honor, the industry's highest personal award.

– – –

Two divisions of Ampex Corp. have been consolidated, forming the new Video Systems Division. The former Video Products Division and the Videofile Information Systems Division were combined.

– – –

Grumman Data Systems Corp. has opened regional offices in New York, Washington, and Los Angeles for the sale and service of Masstape.

– – –

Computer Systems of America, Inc. has arranged for the lease of three IBM 370/165 computer systems to Manufacturers Hanover Trust Co. The first system has been installed in the bank's computer headquarters. The remaining two systems will be installed by the end of 1971.

– – –

Data 100 Corp. has shipped 300 computer terminal systems.

– – –

Russians Order 360/50

IBM Moves Into Eastern European Market

NEW YORK – IBM World Trade Corp. has landed an order for an IBM 360/50 from the Russians – the first such order in its history.

The order is for the system that IBM displayed last month at a computer trade exhibition in Leningrad. It will be installed in the Ministry of Chemistry, if the order receives approval from the Office of Export Control in the Department of Commerce and the Nato Coordinating Committee.

Recently a large order for International Computer Ltd. computer systems was delayed for several months by the objections of the U.S. office and the Nato group.

At that time, ICL spokesmen charged that the order was being delayed so U.S. computer firms would have a chance for other orders planned by the Russians. ICL would not comment directly on the new IBM order, however.

Others Installed

This would not be the only IBM machine installed in Russia if the order is approved. A 360/40 was recently sold by Intercontinental Computer Exchange to the Soviet Radio Ministry and there are several smaller American computers installed in the USSR. However, a Commerce Department spokesman said the 50 would probably be the largest American system sold to the Russians to date.

Welcomes Orders

IBM said it would welcome more orders from the Russians, if this first one is allowed. This would bring the American giant into head-to-head competition with ICL in the burgeoning Soviet market, and ICL already has established a sales office in Moscow, the only western firm allowed in so far.

ICL claims it has already installed systems more powerful than the 360/50 in various Soviet agencies and said the recently approved $24 million order involved systems of the size of the 360/65 and 360/75.

Confirmation Likely

Since that ICL order received clearance by both the U.S. Office of Export Control and the Nato group, it appears likely that the new IBM order will receive approval, possibly faster than the approval given to the ICL deal.

While the ICL order was approved, another recent deal with the Russians died due to opposition from the Nato group. It involved a contract for a CDC 6600 that was to go to the Soviet nuclear research program.

Although IBM would not comment on the size of the potential European market, approval of the 360/50 purchase could lead to rapidly increased sales to that market and to the rest of the eastern European nations.

One of the beneficiaries could well be the Computer Lessors Association, which is eyeing sales to Russia and other eastern European nations as a way of reducing their 360 inventory as customers upgrade to the new 370 series.

Since IBM has received an order, however, it appears that CLA will have as much competition from IBM in that market as it does in the U.S., but the large potential is bound to draw many U.S. firms into the Russian market.

Philips Slates Worldwide Entry Into OEM Minicomputer Market

APELDOORN, The Netherlands – Philips Data Systems, a subsidiary of N.V. Philips here, has entered the worldwide computer market with three 16 bit minicomputers for the OEM market, the P850, P855, and P860 systems.

Marketing emphasis, the firm said, will be on the U.S., with other operations in West Germany, France, the UK, Sweden, Japan, Finland, Denmark, Belgium, The Netherlands, Switzerland, and Italy.

The company, which is one of the largest electronic companies outside of the U.S., and ranks fourth on the *Fortune* International 200 list, will make its first big splash in the U.S. this week at the Fall Joint Computer Conference, where it will display the complete line.

The lowest unit in the line, the P850, comes with 500 words of 16-bit memory and features a 3.2 μsec cycle time in the smallest configuration. It combines TTL technology and medium scale integration and the memory is expandable in 500 word increments, the firm said.

The P855 has a memory cycle time of 1.6 μsec and a basic cycle time of 750 nsec, the firm said. Access time is 500 nsec, Philips added. Memories of 4K- or 8K words plus four controllers are available in the smallest version of the 855, but memory can go up to 16K and the number of controllers can be increased to 11 in the larger version.

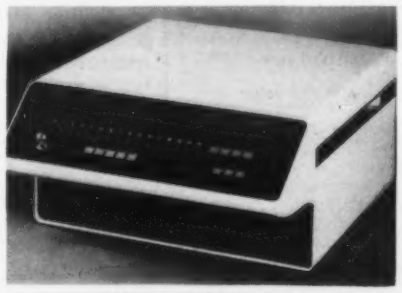
The top of the line, the P860, can handle from 4K- to 32K words, expandable in increments of 4K of memory. It features a cycle time of 840 nsec for 16 bits and an access time of 300 nsec, Philips said.

All models have 16, 16-bit registers: 14 general purpose ones, an instruction counter, and a stack printer. The P855 and P860 have a high-speed arithmetic option, which includes multiply, divide, double add and double subtract.

Software available includes 8K Fortran IV compilers, basic monitor, real-time monitor, one-pass assemblers, a mini assembler for the P850, linking loaders, edit routines, complete mathematical library, drivers for all peripheral equipment and a complete range of diagnostics and utility routines. All software packages are designed to be compatible with each member of the family, the firm said.

Peripheral equipment available ranges from teleprinters, cassette tapes and plotters, magnetic tapes and disks through data communication equipment and a line of controllers and interface capabilities to high-speed devices, all upward compatible, according to Philips.

The P850 minicomputer in a 500 word configuration will sell for approximately



Philips 855 shown at joint

$2,000, the P855 in a 4K word configuration for $3,400, and the P860 in a 4K word 840 nsec configuration for approximately $4,350, in OEM quantities.

Service will be available worldwide, the firm said.

Memorex Realigns Management

SANTA CLARA, Calif. – The duties of James L. Guzy, executive vice-president, have been upgraded at Memorex, but the move does not mean that Lawrence Spitters, president, is being edged out, the firm said.

Under the new arrangement, certain officers who formerly reported to Spitters on a product line and profit center basis will now report to Guzy, and officers will report to Spitters only on a functional basis, the firm said.

Reporting to Guzy will be J.J. Kramer, vice-president of the international group, and R.D. Boucher, vice-president of the information media group. Financial planning and corporate planning functions will report to Spitters, the firm added.

Blast at IBM

In the past few months Guzy has been taking a more active role in stating the firm's position on various industry issues. It was Guzy who blasted IBM for the demise of RCA in the computer business and proposed a commission to draft a consent decree for the breakup of the industry leader [CW, Nov. 10].

Meanwhile, in an address to financial analysts in Boston, Spitters predicted Memorex will post losses for the quarter, nine months and for the year, even though sales would be well over $100 million. Last year, the firm earned $3.2 million on revenues of $79 million.

400 More Workers Cut As RCA Tightens Belt

MARLBORO, Mass. – RCA has laid off 400 more workers as part of its exit from the computer business.

In the latest move, 140 manufacturing, technical support and headquarters staff members here received their walking papers; 110 administrative, marketing and field engineering personnel in Cherry Hill, N.J., were released; 60 marketing and support people were cut from Palm Beach Gardens, Fla., and 90 staffers were cut from the field marketing and support operation.

There are now 1,170 people left at the firm in Marlboro, 1,200 in the New Jersey operation, 1,600 in Palm Beach Gardens, and 2,300 remaining in the field force, the firm said.

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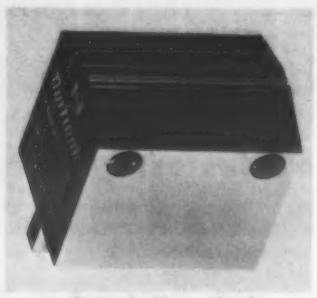

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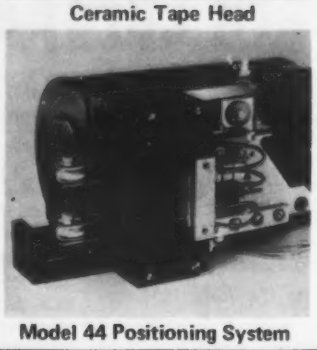

Model 44 Positioning System

Pertec Unveils 25 in./sec Tape Units

CHATSWORTH, Calif. – A new series of 7-in. reel tape transports from Pertec Peripheral Equipment attain tape speeds to 25 in./sec. The units are primarily designed for data entry and data terminal applications requiring synchronous transports.

Purchased in quantities of 100, the 1,600 char./in. read-after-write transports sell for $3,010, and the 1,600 char./in. write/read for $2,630.

The Pertec 7000 series transports include all data electronics, bring to load point logic, and tape motion control electronics.

Pertec also offers data formatters compatible with these transports which will allow the same controller to handle 9-track 1,600 char./in. phase-encoded and 800 char./in. NRZI Ansi and IBM compatible formats.

The firm is at 9600 Irondale Ave., 91311.

Nortronics Unveils Lifetime Ceramic Heads

MINNEAPOLIS, Minn. – Nortronics Co., Inc. has announced a series of Lifetime Ceramic (LTC) heads for computer tape drives.

The face of the magnetic head is contoured to within 0.010 in. of the gap on each side. The non-magnetic ceramic finish is then applied to the face to fill in previously contoured areas. The head is then recontoured to obtain the desired surface.

With the proper profile, the gap area in the core face will stabilize at 0.000020 in. below the ceramic surface. Then, with proper tape wrap and tension, tape will bridge the core area at the gap, riding principally upon the hard ceramic coating at a fixed distance from the gap, according to the firm at 8101 Tenth Ave. N., 55427.

Eeco Tape Readers Bow

SANTA ANA, Calif. – Electronic Engineering Co. of California's (Eeco) new 9000 series family of punched tape readers for the commercial tape reader market consists of five basic models that are all bidirectional.

The basic model, the "Mini-Reader," mounts on a 5-1/4 in. high by 7 in. wide panel and is furnished without power supply. The second reader is complete with all electronics and power supply mounted on a 5-1/4 in. by 19 in. panel.

The third model is a fan-fold reader which provides 150 ft of tape storage and mounts on a 7 in. by 19 in. panel. The other models are reader/spooler combinations. The smaller has 5-1/4 in. diameter reels on a 5-1/4 in. by 19 in. panel, and the larger unit has a 7-1/2 in. reels on an 8-3/4 in. by 19 in. panel.

The firm is at 1441 E. Chestnut Ave., 92701.

New OEM Products

Positioning System Out

GOLETA, Calif. – A head positioning system for rotating memories has been announced by Information Magnetics Corp. Designated the Model 44, the system is designed to position read/write heads on IBM 5444, 2310 and similar cartridge type disk drives.

The unit incorporates an electromagnetic linear actuator, carriage and ways, head load/unload tower, magnetic position transducer, and a velocity transducer.

Track-to-track access time is 8 msec. One-third stroke, or 67 tracks are accessed in 50 msec, and full stroke, 202 tracks in 80 msec. Constant force stroke length is 2 in., and total travel is 3.5 in., according to the firm at 5743 Thornwood Drive, 93017.

Motorola Shows New ROM

PHOENIX, Ariz. – Motorola Semiconductors' new programmable ROM, the MCM5003AL/5004AL, is a 512-bit field programmable unit that is tested before programming the array.

Motorola has added a ninth bit to the normal 64 8-bit word organization. A few of the 64 links of the ninth bit are opened at the factory for element testing, functional testing, and ac testing.

The MCM5003AL has open collector outputs and the 5004AL has 2-kΩ collector pullup resistors resulting in output current sinking of 12 mA and 10 mA respectively.

Access time is less than 75 nsec, and in addition to the six address bits, two chip-enable inputs are provided for memory expansion. The package is a 24-pin, dual-in-line ceramic.

Devices are priced at $27.50 each in 100-up quantities for either option. The firm's mailing address is Box 20912, 85036.

LEDs Bow at Litronix

CUPERTINO, Calif. – A four-digit array of seven segment LED displays has been added to the Litronix line.

The Data-Lit 34 has .125 in./char. height, and brightness of 200 ft. L. at 5mA. In pulsed operation, with average current around 2mA, the device has a typical brightness of 100 ft L.

The four digits are mounted in a 14 pin DIP package. The digits are mounted on .187 in. centers and are end-stackable for expanding the array to 8, 12 or 16 digits. The segments of each numeric are connected in parallel for multiplexing. Each segment can be addressed independently.

The DL-34 is available at $3.80 per digit in 1,000 piece quantities.

Remex Tape Reader Debuts

SANTA ANA, Calif. – A punched tape reader for typesetting applications capable of reading both eight and six level feedhole advanced tapes interchangeably has been announced by the Remex unit of Ex-Cell-O Corp.

The reader, a version of the Model RR-ll50BB, is available in reader/spooler models and bidirectional providing speeds up to 150 char./sec in step mode (nominally 220 in slew mode).

The Model RR-ll50BB is priced at $595 in orders up to nine units, according to the firm at 1733 Alton St., 92705.

Litton CRT Scans Microfilm

SAN CARLOS, Calif. – A cathode ray tube, the L-4249, for microfilm recording and scanning applications is available from Litton Industries Electron Tube Division.

The L-4249 CRT features a 0.002 in. spot size and a 26° deflection angle. The tube has a flat face with a nominal outside diameter of 5 in., and is available with most standard phosphors. The firm is at 960 Industrial Road, 94070.

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The package is currently operating in both an OS and DOS environment of the IBM 360. The package will be installed and supported in other hardware environments using ANS COBOL and certain other manufacturer's COBOL compilers.

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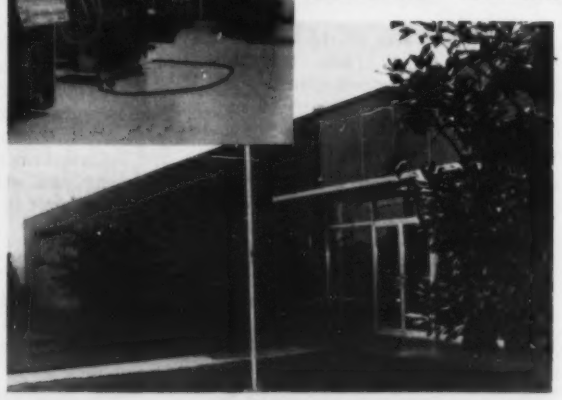
COMPUTER PERIPHERAL MANUFACTURERS' LEASE/FINANCING PROBLEMS DISCUSSED

Phoenix, Arizona — Manufacturers' Lease Plans, Inc. (MLPI), a subsidiary of Systems Capital Corporation, is offering a lease/financing program geared to solve many of the problems currently confronting computer peripheral manufacturers. These problems are essentially the initial negative cash flow resulting from direct leasing by the manufacturer and equally as important, the problems of recording sales to third parties as bona fide sales.

MLPI has been offering responsive programs of this type to manufacturers in the computer peripheral industry for the past three years. However, the recent interpretation by the Accounting Principles Board (APB) of Opinions No. 5 and 7 (Accounting for Leases) has caused considerable concern within an industry heavily dependent on third party financing. This interpretation tightened up the rules, with the result that manufacturers will not be permitted to record sales to third parties as "sales" if they are obligated in any way to guarantee the third party a return on his investment. These obligations may include a form of limited recourse (repurchase agreement, rental payment guarantee, substitution of paper, etc.) or a remarketing commitment which includes a "best efforts" connotation. Such considerations, the APB has indicated will normally negate the sales concept and the transaction will have to be recorded as a loan with income recognized on a month-to-month basis as it is received.

MLPI's president, Bob Mandeville, stated that MLPI intends to remain responsive to the peripheral manufacturers' needs and will offer programs which comply with the new APB interpretations and which will allow its manufacturer clientele to record purchases by MLPI as sales on the manufacturers' books of account. For further information, contact MLPI at 3443 North Central Avenue, Suite 1200, Phoenix, Arizona 85012, telephone (602) 264-9521. Mandeville also indicated that he will be attending the FJCC in Las Vegas and that he can be reached at the Frontier Hotel from November 16 through 18.



Above: TLW's remanufacturing and technical center in Atlanta, Georgia. 15,000 square feet devoted entirely to producing quality in excellence and guaranteeing IBM maintenance. Shown: a 360 Model 30, 2 1401 systems being manufactured.

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Facilities Management Faces Big Test As Commodities Exchange System Starts

CHICAGO – Facilities management is getting a big test here as the Chicago Board of Trade begins operating a computer-based system for recording all commodity trading.

The Chicago Board of Trade, world's largest commodities exchange and second largest financial institution in the U.S. is placing its computerized price reporting system in the hands of Executive Computer Systems, Inc., a facilities management firm located more than 15 miles from the exchange's trading floor.

This is the first time a major U.S. exchange has turned a major portion of its computer operations over to an outside agency, according to CBT spokesmen.

The Commodity Price Reporting System is based around an IBM 360/50 with a 360/40 for backup in case of failure, and has been under development for over 2 years.

The system also employs 26 Ultronic Systems Videomaster 7700 terminals and front-end processors based around the MAC-16 minicomputer produced by Lockheed Electronics Corp.

Data is entered into the system in the trading pit of the particular commodity, such as soybeans, silver or corn, and transmitted to the computer center in Oak Park, Ill.

From there the data is transmitted back to the floor, after it has been evaluated for "reasonability" to be displayed by the electronic display boards on the trading floor.

At the same time, the computer system, which can handle up to 20 transactions simultaneously, sends the data out on the CBT ticker network which goes to London, Paris, Madrid and other world-wide locations as well as those in the U.S.

CRT unit joins soybean commodities traders.

CSC Lands Navy Contract To Help Vietnamization

LOS ANGELES – Computer Sciences Corp. will provide technical services to the Military Assistance Command in Vietnam in support of the government's Vietnamization program under a contract with the U.S. Navy Purchasing Office.

The contract, valued at $1.5 million, is the largest contract ever in the U.S. program to assist the Republic of Vietnam become self-sufficient, CSC sources claimed.

Contracts

Under the pact, CSC will provide computer-based services in the development and maintenance of the Civil Operations and Rural Development Support (Cords) program, that is used to monitor the progress of the Vietnamese pacification program.

Other Contracts

The Friden Division of The Singer Co. has won a "multimillion" dollar contract to supply data processing equipment to U.S. Army Commissaries. Deliveries of the equipment have already begun and will be completed by mid-1972. The firm said that the pact represents the first use of computer equipment by the Army commissary system.

Nasa has awarded a two-year support service contract valued at about $3 million to Computing and Software Inc. The contract calls for research DP services and document conversion at Nasa's Langley Research Center.

Programming Methods Inc. has a contract to supply the British government with its Score information retrieval and reporting program package, which sells for $12,500.

Cambridge Memories will supply its Expandacore 18 memory systems to Intercomputer Corp. under a contract valued at over $300,000. The memories will be used in the Intercomputer I-50 and I-27ON computers that are used for pre-processing functions.

Electronic Data Preparation Corp. has won its second facilities management pact from the Indiana government in the past 14 months. The new contract calls for the firm to assume responsibility for an on-site data conversion facility for the state's Bureau of Motor Vehicles and is valued at over $800,000 annually.

The General Services Administration has awarded a contract to Computer Automation Inc. for the acquisition of "an indefinite amount" of computer equipment through June of next year.

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Hitachi/Fujitsu Agreement Seen Part of Industry Consolidation

TOKYO – The recent announcement that Hitachi and Fujitsu would enter into joint development of computer systems is just part of a move to strengthen the Japanese domestic computer manufacturers, sources here report.

The planned liberalization of import rules on computer equipment at an early date is the main factor behind the move, they said. The liberalization of computer imports will probably come within three years and duties on peripheral equipment imports will probably be lowered next year, they predicted.

In order to strengthen the Japanese industry against the expected competition, the Ministry of International Trade and Industry (Miti) will promote mergers that would reduce the number of Japanese firms in the computer field.

The Japanese sources said Miti will allocate close to $50 million over the next five years on the condition that the present six domestic manufacturers are grouped into three.

According to the Minister of International Trade and Industry, negotiations between Tokyo Shibaura Electric Co., Ltd., and Nippon Electric Co., and between Mitsubishi Electric Corp. and Oki Electric Industry Co. are underway for cooperation in the development of computers.

Murchison Replaces Qureishi At Optimum In President's Office

PALO ALTO, Calif. – Clint W. Murchison, Jr., has been named president and chairman of Optimum Systems, Inc., replacing A. Salam Qureishi, who remains a director of the privately-held corporation.

Murchison, a well-known Texas businessman, has been a director and financial backer of the computer services firm since it was founded in 1967.

OSI also announced that Stanley L. Neeley has been named to the post of vice-president and general manager of operations and that Norman K. Kaupp becomes vice-president for finance and administration. Both were named to the board, along with Kenneth Patchett, president of the OSI subsidiary E.B.S. Data Processing Inc.

Executive Corner

Other Moves

■ James Dobbie has jumped from his position as Director of Engineering at Raytheon Computer Operations to take the post of vice-president of engineering for Varian Data Machines. Before joining Raytheon, Dobbie was manager of systems engineering for GE's Information Systems Division.

■ MCI Communications Corp. has named Stanley B. Scheinman senior vice-president and chief finance and administration officer, a new post. He formerly was vice-president for finance and administration at USV Pharmaceutical Corp., a division of Revlon, Inc.

■ The position of vice-president for the research and development division of Systems Development Corp. has been filled by Dr. Donald A. Dooley, previously vice-president of the space shuttle program at General Dynamics Convair Aerospace Division. SDC also said it had promoted Harold Willson from the post of personnel administration to vice-president for industrial relations.

■ E. Richard Williams has been appointed vice-president of marketing of Computer Machinery Corp.'s Data Processing Division. Before the appointment, he was director of sales with Telex Computer Products Inc.

■ Ronald S. Posner and Samuel T. Soberanes have been elected vice-presidents of Tratec Inc., formerly Resource Computer Corp. Posner will be responsible for development of the firm's current sales education workshops and Soberanes will head up direct marketing activities for those programs.

■ Samuel G. Johnson has been elected executive vice-president of Syncom Inc. in addition to his post as president of Syncom's Shieldata Division. In addition, Wesley C. Dudley has been elected Secretary and James C. Forman, treasurer for the firm.

■ The position of vice-president for corporate development at Systems, Science and Software has been filled by Charles D. Martin, formerly vice-president of marketing for Digital Resources Corp.

Orders & Installations

Three IBM 370/165s will be installed in the computer center of Manufacturers Hanover Trust. The first 165 was installed in September at the bank, which is the fourth largest in the U.S.

American Enka Co. has ordered a GE-PAC 4010 process computer from GE's Manufacturing and Process Automation Division. The system will be used for data logging and quality control on synthetic fiber production.

NCR has landed an order valued at $2 million from the State Street Bank and Trust Co. for NCR 270 data terminals. The 200 terminals will be used by tellers in banks which subscribe to State Street's DP services.

Information Displays has sold an Idads interactive automatic drafting system to Controlmation Systems, Inc. In addition, Information Displays reported the following orders for Idiiom interactive displays: General Electric Apollo and Ground Systems Division; the University of California Los Alamos Scientific Laboratory; and the Air Force Eastern Test Range.

Pacific Micronetics Inc. has delivered a Fastrack 100 series disk memory system to Nasa's Langley Research Center to be used in a computer performance monitoring system being developed at the center.

Louisiana Polytechnic Institute has installed an IBM 370/145, replacing an IBM 360/50. The system is used in 235 courses, 207 research projects and by 16 administrative departments.

Broadcast Advertisers Reports, Inc. will lease a Scan-Data Model 200 OCR page reader. The firm tracks commercial TV patterns by monitoring all TV stations in the top 75 market areas of the U.S.

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Acquisitions

Computer Dimensions, Inc. (CDI), a Dallas-based data processing firm, has acquired **Church Systems, Inc.**, which provides automated accounting services to churches. CDI also acquired an interest in the credit union services of **CTC Computer Corp.**, as well as the communications division of **NCS Computing Corp.**

National Information Systems Corp. and **Computer Investments & Leasing Corp.** have agreed in principle to merge, subject to the approval of shareholders.

Computervision Corp. and **Cobilt Inc.** have entered into an agreement for the merger of Cobilt into Computervision, subject to the approval of Computervision stockholders. Both companies manufacture mask alignment systems for the semiconductor and thin film industries.

Shareholders of **Engineered Data Peripherals Corp.** (EDP) have approved the merger of the company into **Tally Corp.**, producer of computer peripheral and data communications equipment. EDP will manufacture disk memory systems as a division of Tally.

The boards of **University Computing Co.** and its facilities management subsidiary, **Computer Technology Inc.**, approved the merger of CTI into UCC for an exchange of stock. The proposed merger is subject to shareholder approval.

Data Recognition Corp., special purpose optical character recognition (OCR) systems manufacturer, agreed in principle to purchase **Kramer Research Inc.**, a California OCR research and development firm.

Johns-Mansville Corp. of New York has acquired **Applied Computer Technology Corp.** (ACTC) of Los Angeles. ACTC, originator of a computer program for financial planning, will become a subsidiary of Johns-Manville.

Imlac Corp. has acquired **Vision Systems Inc.**, Bedford, Mass., a software development firm specializing in computer graphics and general systems software.

Computer Property Corp. and **Fairfield Communities Land Co.** have agreed in principle to merge for an exchange of stock. The companies are engaged in land development, compufer sales, and leasing and software development.

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Leasing Business Seen Recovering, Boothe, Greyhound, Rockwood Report

NEW YORK – Recent reports from three leasing companies, Boothe Computer Corp., Greyhound Computer Corp., and Rockwood Computer Corp., indicate that the leasing business is recovering from the low point reached last year.

Boothe Computer reported net income of $2.5 million, or $1.29 per share, for the nine-month period ended Sept. 30, an increase of 22% over the $2 million, or $1.08 per share income for the same period a year ago.

Revenues for the nine months were $48.3 million, up 50% over the comparable 1970 revenues of $32.1 million.

For the third quarter income was $680,000 compared with $677,000 for the same period a year ago. Revenues for the period increased to $15.8 million compared with almost $11 million a year ago.

The activity of the leasing division continues at a high level, with virtually 100% of the company's computer inventory on rental and generating revenues at all times, said Chairman D.P. Boothe Jr. The other subsidiaries of the company are operating satisfactorily.

Greyhound Computer reported third quarter net income of $1.1 million, equal to 25 cents a share, an increase of 44% from the comparable quarter in 1970, when net income was $764,000, or 18 cents a share.

For the nine months ended Sept. 30, net income was $3.1 million, equal to 72 cents a share, up 24% from net income of $2.5 million, equal to 58 cents a share, in the first nine months of 1970.

Revenues totaled $11.8 million in the third quarter and $35.4 million in the nine months, down slightly from $12.4 million and $37.2 million respectively in 1970.

Better utilization of U.S. computer rental equipment and substantially lower interest costs, which more than offset declining U.S. computer leasing rates, were cited by Greyhound Computer President W. Carroll Bumpers as reasons for the improved results. Third quarter data services results from the UK were significantly improved compared with the first half of 1971, he said.

Rockwood Computer reported total revenues in the first six months rose 13% to $25.8 million, up from $22.9 million. Net income for the period ended Sept. 30 amounted to $1.2 million, or 37 cents per share, compared with a loss of $5.2 million or $1.57 per share, for the comparable six month period of the prior fiscal year.

New Registrations

COMPUTER AUTOMATION INC., 895 W. 16th St., Newport Beach, Calif., digital computer manufacturer, filed to register 250,000 shares of common. Proceeds, at $8/share, to be used to repay short-term loans and for working capital. The underwriter is F.S. Bonahue, Santo & Co., 176 Riverside Ave., Red Bank, N.J. 07701.

THE SYSTEMS CORP., 1441 Kapiolani Blvd., Honolulu, Hawaii, a service company providing hardware, software, operations, maintenance and training, filed to register 300,000 shares of common. Proceeds at $5.50/share (minimum purchase of 100 shares), to be used to develop applications software packages and for working capital. No underwriter is involved.

HONEYWELL FINANCE INC., 2701 4th Ave. S., Minneapolis, Minn., financer of receivables for Honeywell Information Systems, Inc., filed to register $50 million of debentures, due 1978. Proceeds to be used to reduce short-term debts. The underwriter is Eastman Dillon, Union Securities & Co., Inc., One Chase Manhattan Plaza, New York, 10005.

COMPUTER DESIGN CORP., 12401 W. Olympic Blvd., Los Angeles, filed to register 30,000 shares of common, to be issued pursuant to the company's stock purchase plan.

CPU INTERNATIONAL INC., 853 Broadway, New York, which will market software packages, filed to register 135,000 shares of common stock. Proceeds at $6/share maximum, intended for working capital. The underwriter is Gotham Securities Corp., 565 Fifth Ave., New York, 10017.

INFORMATION MAGNETICS CORP., 5743 Thornwood Drive, Goleta, Calif., which makes components for peripheral equipment, filed to register 250,000 shares of common. Proceeds, at $10/share maximum, to be used for new product development and for working capital. The underwriter is Morgan, Olmstead, Kennedy & Gardner Inc., 606 S. Olive St., Los Angeles, Calif. 90014.

BRADFORD COMPUTER & SYSTEMS, INC., 1700 Broadway, New York, N.Y. filed to register 338,126 shares of common stock at $35/share maximum. The underwriter is Goldman, Sachs & Co., 55 Broad St., New York, N.Y.

DIGITAL EQUIPMENT CORP., 146 Main St., Maynard, Mass., filed to register 300,000 shares of common stock, reserved for issuance pursuant to the company's 1968 stock purchase plan.

ADVANCED COMPUTER SUPPLIES, INC., data processing card maker, filed to register 100,000 shares of common. Proceeds, at $5/share maximum, to be used for working capital. The underwriter is Lineberger, Lowe & Co., Inc., 76 Beaver St., New York, N.Y. 10005.

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Computerworld Stock Trading Summary

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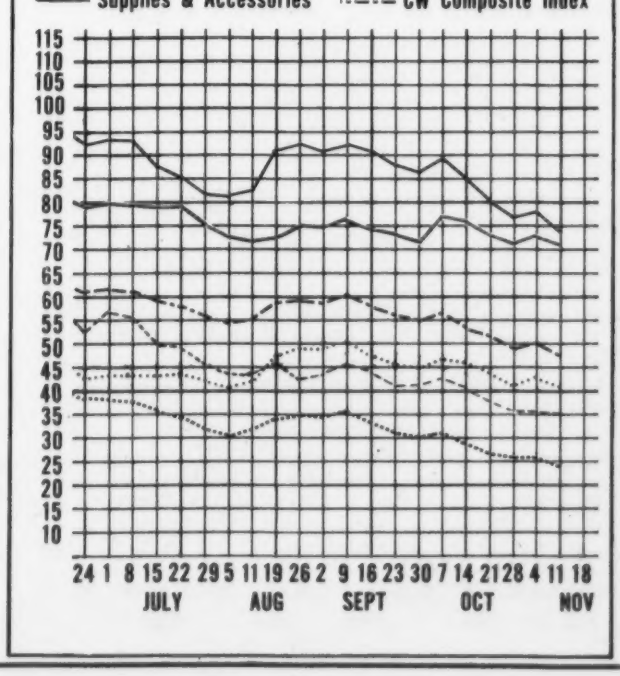
CLOSING PRICES THURSDAY, NOVEMBER 11, 1971

EXCH		1971 RANGE (1)	CLOSE NOV 11 1971	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 4	1 3/4	+ 1/4	+16.6
A	APPLIED DATA RES.	5- 13	4 3/4	- 3/8	-7.3
O	APPLIED LOGIC	1- 3	3/8	+ 1/8	+50.0
N	AUTOMATIC DATA PROC	44- 66	58 3/8	-2 5/8	-4.3
O	AUTO SCIENCES	1- 8	7/8	0	0.0
O	COMPUTER NETWORK	2- 11	5	-1 1/2	-23.0
O	COMPUTER PROPERTY	5- 11	5 3/4	0	0.0
N	COMPUTER SCIENCES	6- 17	7 1/8	+ 1/4	+3.6
O	COMPUTER TECHNOLOGY	5- 11	4 3/	- 3/4	-14.6
O	COMPUTER USAGE	5- 16	6 1/2	- 1/2	-7.1
O	COMP AUTOMOT REPORTS	6- 13	7 1/4	- 1/4	-3.3
N	COMPUTING & SOFTWARE	19- 45	19 5/8	-1 1/8	-5.4
O	COMRESS	2- 4	1 5/8	- 1/8	-7.1
O	COMSHARE	4- 8	4 1/4	- 1/8	-2.8
O	DATA AUTOMATION	1- 4	3/8	- 1/4	-40.0
O	DATA PACKAGING	6- 10	6 3/4	0	0.0
O	DATAMATION SERVICE	1- 3	1/2	0	0.0
L	DATATAB	4- 10	6 1/8	- 1/2	-7.5
O	EDP RESOURCES	6- 16	5 3/4	- 3/4	-11.5
A	ELECT COMP PROG	2- 7	2 1/2	+ 3/8	+17.6
N	ELECTRONIC DATA SYS.	34- 85	33 5/8	-9 3/4	-22.4
O	INFORMATICS	7- 15	6 1/2	- 3/8	-5.4
O	I.O.A. DATA CORP	1- 3	1 1/8	0	0.0
A	ITEL	7- 23	6 1/2	- 1/4	-3.7
O	KEANE ASSOCIATES	4- 14	5	- 1/4	-4.7
O	KEYDATA CORP	5- 14	7 3/4	+ 1/2	+6.8
A	MANAGEMENT DATA	5- 11	5 1/4	- 3/8	-6.6
O	NATIONAL CSS INC	7- 14	7 3/4	- 1/4	-3.1
O	NAT COMP ANALYSTS	1- 4	1/2	0	0.0
P	ON LINE SYSTEMS INC	7- 18	8 1/2	-1	-10.5
N	PLANNING RESEARCH	12- 26	11 1/2	- 3/4	-6.1
O	PROGRAMMING METHODS	16- 29	19	0	0.0
O	PROGRAMMING & SYS	1- 4	1 3/8	0	0.0
O	SCIENTIFIC COMPUTERS	2- 3	2 1/2	0	0.0
O	SIMPLICITY COMPUTER	1- 4	3 5/8	- 1/4	-6.4
O	SOFTWARE SYSTEMS	1- 3	7/8	- 1/4	-22.2
O	TBS COMPUTER CENTERS	4- 9	4 1/2	-1	-18.1
O	TOLLEY INTL CORP	3- 8	6	- 1/4	-4.0
O	TRACOR COMPUTING	2- 5	1 7/8	- 1/8	-6.2
O	TYMSHARE INC	4- 15	7 7/8	- 1/2	-5.9
O	UNITED DATA CENTER	2- 7	5 1/4	- 1/8	-2.3
N	UNIVERSITY COMPUTING	15- 38	15	-2 1/4	-13.0
A	URS SYSTEMS	5- 11	5 1/4	- 3/8	-6.6
O	VORTEX CORP	2- 6	6	0	0.0
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	24- 48	30 1/2	-2 1/2	-7.5
O	ALPHANUMERIC	1- 6	1 1/8	- 1/4	-18.1
N	AMPEX CORP	14- 25	13 3/4	-1	-6.7
O	ANDERSON JACOBSON	6- 10	5 1/2	- 1/4	-4.3
O	ATLANTIC TECHNOLOGY	3- 8	2 7/8	+ 1/4	+9.5
A	BOLT,BERANEK & NEW	4- 8	4 1/4	- 3/4	-15.0
N	BUNKER-RAMO	6- 17	6	- 3/4	-11.1
A	CALCOMP	15- 33	15 3/4	-1 3/4	-10.0
O	COGNITRONICS	2- 9	2	- 1/4	-11.1
O	COLORADO INSTRUMENTS	2- 8	1 3/4	- 1/4	-12.5
O	COMPUTER COMMUN.	6- 19	6 1/4	- 1/2	-7.4
A	COMPUTER EQUIPMENT	3- 7	2 7/8	0	0.0
A	COMPUTEST	5- 20	4 5/8	- 1/4	-5.1
O	CONSOL COMPUTER LTD.	1- 12	1	-1 1/8	-52.9
A	DATA PRODUCTS CORP	3- 10	4 1/4	+1	+30.7
O	DATA RECOGNITION	3- 8	4 1/2	- 1/4	-5.2
O	DATA TECHNOLOGY	3- 9	3 5/8	0	0.0
O	DIGITRONICS	2- 8	3 3/8	+ 3/4	+28.5
N	ELECTRONIC M & M	5- 16	5 1/8	-1 5/8	-24.0
O	FABRI-TEK	2- 4	2 1/4	- 1/8	-5.2
O	GENERAL COMPUTER SYS	6- 10	6 1/2	- 1/4	-3.7
N	GENERAL ELECTRIC	53-124	56 3/8	-2 1/4	-3.8
O	INFOREX INC	17- 49	17	-4	-19.0
O	INFORMATION DISPLAYS	4- 8	4	- 1/8	-3.0
O	MANAGEMENT ASSIST	1- 2	7/8	+ 1/4	+40.0
A	MARSHALL INDUSTRIES	7- 27	7 1/2	-2 1/8	-22.0
N	MEMOREX	21- 78	21 1/8	-6 1/4	-22.8
A	MILGO ELECTRONICS	12- 26	12	-1 1/8	-8.5
N	MOHAWK DATA SCI	18- 47	17 7/8	-1	-5.2
O	OPTICAL SCANNING	7- 18	6 1/2	- 5/8	-8.7
O	PHOTON	6- 12	6 1/4	+ 3/8	+6.3
A	POTTER INSTRUMENT	13- 25	13 3/8	- 5/8	-4.4
O	PRECISION INST.	7- 16	8	-2	-20.0
O	RECOGNITION EQUIP	9- 26	8 5/8	-2 3/8	-21.5
O	REDCOR CORP.	1- 9	1 1/2	- 1/4	-14.2
N	SANDERS ASSOCIATES	10- 22	10	- 1/4	-2.4
O	SCAN DATA	6- 15	8 5/8	-1	-10.3
O	TALLY CORP.	8- 16	8 1/4	- 1/2	-5.7
N	TELEX	10- 22	10	- 3/4	-6.9
	SUPPLIES & ACCESSORIES				
N	ADAMS-MILLIS CORP	10- 19	10	- 5/8	-5.8
O	BALTIMORE BUS FORMS	6- 10	8 3/4	0	0.0
A	BARRY WRIGHT	7- 13	7 1/4	- 1/4	-3.3
A	DATA DOCUMENTS	14- 29	14 1/2	+ 1/4	+1.7
O	DUPLEX PRODUCTS INC	8- 11	11 1/4	+ 1/8	+1.1
N	ENNIS BUS. FORMS	6- 13	5 7/8	0	0.0
O	GRAHAM MAGNETICS	9- 35	18 1/2	-1	-5.1
O	GRAPHIC CONTROLS	6- 15	11 1/2	+ 3/8	+3.3
N	3M COMPANY	96-126	119 1/8	-2 7/8	-2.3
O	MOORE BUS. FORMS	36- 42	37 1/4	+ 3/8	+1.0
N	NASHUA CORP	29- 47	45	- 1/4	-0.5
O	REYNOLDS & REYNOLD	37- 63	56	-3 1/2	-5.8
O	STANDARD REGISTER	14- 23	14 3/8	- 1/8	-0.8
O	TAB PRODUCTS CO	8- 17	15 1/2	-1	-6.0
N	UARCO	25- 34	25 1/4	-2	-7.3
A	WABASH MAGNETICS	5- 10	6 1/8	- 5/8	-9.2
N	WALLACE BUS FORMS	18- 26	20 1/8	- 1/4	-1.2
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	105-143	131	-1 1/2	-1.1
N	COLLINS RADIO	10- 20	10 3/4	-1	-8.5
N	CONTROL DATA CORP	37- 83	37 3/8	-1 3/4	-4.4
O	DATA GENERAL CORP	19- 65	48 3/4	- 1/4	-0.5
O	DIGITAL COMP CONTROL	4- 24	13 3/4	- 1/4	-1.7
N	DIGITAL EQUIPMENT	53- 85	65 1/2	-4 3/4	-6.7
N	ELECTRONIC ASSOC.	5- 9	4 5/8	- 1/8	-2.6
A	ELECTRONIC ENGINEER.	5- 10	7 1/2	0	0.0
N	FOXBORO	25- 46	27 1/4	-7 1/4	-21.0
O	GENERAL AUTOMATION	9- 26	12 1/2	+4 3/4	+6.3
N	HEWLETT-PACKARD CO	30- 46	38 1/8	-1 5/8	-4.0
N	HONEYWELL INC	83-115	105 3/4	-5 1/4	-4.7
N	IBM	284-364	292 1/4	-8	-2.6
O	INTERDATA INC	6- 11	7 1/2	- 3/8	-4.7
N	NCR	26- 49	25 3/4	-2 1/2	-8.8
N	RCA	26- 41	31 5/8	-1 3/8	-4.1
N	RAYTHEON CO	27- 46	32 5/8	-2 1/4	-6.4
N	SPERRY RAND	23- 38	24 1/8	- 5/8	-2.5
A	SYSTEMS ENG. LABS	7- 18	7 1/2	+ 1/8	+1.6
N	VARIAN ASSOCIATES	11- 18	11 1/4	-2	-15.0
N	VICTOR COMPTOMETER	13- 27	12 1/2	-1	-7.4
N	WANG LABS.	29- 50	33	-2 1/2	-7.0
N	XEROX CORP	85-121	110 1/4	-2 5/8	-2.3
	LEASING COMPANIES				
A	BOOTHE COMPUTER	11- 27	12 5/8	- 5/8	-4.7
O	BRESNAHAN COMP.	2- 4	1 3/4	- 1/8	-6.6
O	COMPUTER EXCHANGE	2- 9	2 1/4	- 1/8	-5.2
A	COMPUTER INVSTRS GRP	8- 14	7 3/4	- 1/2	-6.0
N	DATA PROC. F & G	10- 19	9 1/2	-1 5/8	-14.6
O	DATRONIC RENTAL	2- 4	2 5/8	0	0.0
A	DCL INC	5- 13	7 3/4	- 1/4	-3.1
A	DEARBORN-STORM	12- 23	19 1/8	- 7/8	-4.3
A	DPA, INC.	4- 9	7 5/8	- 3/8	-4.6
A	GRANITE MGT	7- 13	8	- 1/2	-5.8
A	GREYHOUND COMPUTER	7- 11	7 1/2	- 1/4	-3.2
N	LEASCO CORP	16- 26	19 3/4	-2 1/4	-10.2
O	LECTRO MGT INC	2- 5	3 3/4	0	0.0
O	NCC INDUSTRIES	3- 8	6	+ 1/8	+2.1
A	ROCKWOOD COMPUTER	4- 9	3 1/2	- 1/2	-12.5
O	SYSTEMS CAPITAL	3- 7	3 7/8	0	0.0
N	U.S. LEASING	16- 39	34 3/8	0	0.0

EXCH: N=NEW YORK EXCHANGE; A=AMERICAN EXCHANGE
L=NATIONAL EXCHANGE; O=OVER-THE-COUNTER
P=PHIL-BALT-WASH
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Computer Stocks Trading Index



Earnings Reports

HAZELTINE
Three Months Ended Sept. 30

	1971	1970
Shr Ernd	.....	$.10
Revenue	$7,785,000	14,059,000
Earnings (Loss)	(163,000)	197,000
9 Mo Shr	.....	.52
Revenue	24,096,000	45,247,000
Earnings (Loss)	(743,000)	1,021,000

INT'L TIMESHARING
Three Months Ended Aug. 31

	1971	1970
Shr Ernd	$.01	$.01
Revenue	773,431	593,115
Earnings	23,836	12,905

QUANTRONIX CORP.
Three Months Ended June 27

	1971	1970
Revenue	$407,988	$156,199
Earnings (Loss)	5,153	(82,075)

DATA AUTOMATION
Six Months Ended July 31

	1971	a1970
Revenue	$2,314,153	$1,752,099
Loss	309,494	3,964,680

a-Restated by company.

TEC, INC.
Three Months Ended July 31

	1971	1970
Shr Ernd	$.04	.....
Revenue	977,767	$1,109,507
Earnings	27,368	828

METRIDATA COMPUTING
Three Months Ended Sept.30

	1971	1970
Shr Ernd	a$.09	$.05
Revenue	661,943	423,613
Spec Cred	b29,000	.....
Earnings	c61,171	15,461
9 Mo Shr	a.23	.....
Revenue	1,960,739	1,008,766
Spec Cred	b66,400	.....
Earnings (Loss)	c151,291	(36,321)

a-Based on income before special credit. b-Tax-loss carryforward credit. c-Equal to 17 cents a share in the quarter and 42 cents a share in the nine months.

INTERSYSTEMS
Three Months Ended Sept. 30

	1971	1970
Revenue	$2,252,000	$2,014,000
Tax Cred	147,000	284,000
Loss	147,000	291,000

DATA PRODUCTS
Six Months Ended Sept. 25

	1971	1970
Shr Ernd	a$.01	.....
Revenue	25,548,000	$19,457,000
Spec Cred	b130,000	.....
Earnings (Loss)	c217,000	(987,000)

a-Based on income before special credit. b-Tax-loss carryforward. c-Equal to 3 cents a share.

SPERRY RAND
Three Months Ended Sept. 30

	1971	1970
Shr Ernd	$.29	$.50
Revenue	405,997,000	409,435,000
Earnings	9,886,000	17,072,000
6 Mo Shr	.64	1.00
Revenue	820,211,000	836,562,000
Earnings	21,917,000	34,247,000

XEROX
Three Months Ended Sept. 30

	1971 (000)	1970 (000)
Shr Ernd	$.68	$.61
Revenue	493,300	435,800
Earnings	53,200	47,600
9 Mo Shr	1.98	1.81
Revenue	1,442,200	1,266,700
Earnings	155,700	141,500

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More than 250 IBM 360 users have purchased the Westinghouse disk utility software in 1971.

30-day free trial

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Outstanding features

Our system runs faster than other disk utility programs, uses less storage, and verifies all data copied. It is self-relocating—runs in both background and foreground partitions. It is totally compatible with the standard IBM disk operating system. It has been operational for two years.

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The one-time charge is $700. That's it. No reprogramming. No installation time. No educational costs.

Proved performance

Recently, one customer reported the following run times* using this Westinghouse disk utility software.

Utility function	Min	Sec
Disk to disk	9	44
Disk to tape	3	30
Tape to disk	5	13
Total	18	27

*Excerpted from COMPUTERWORLD, December 1970

This was on a 126K IBM 360/40, under DOS, tape and disk same channel, with IBM 2407 tape drives and IBM 2314 disks.

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